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ABSTRACT

This handbook is designed to help vocational educators identify changes in the labor market and to incorporate these changes quickly and effectively into their curricula. It guides teachers and administrators through the major steps in developing competency-based curricula for new and emerging occupations--i.e., (1) to identify new and emerging occupations; (2) to perform task analysis on a new and emerging occupation; and (3) to develop competency-based vocational education curricula. The handbook is divided into three major parts corresponding to each of these three steps. Each section contains a list of terms used in it, as well as the step-by-step procedures. Examples and sample forms for vocational educator use are also included. The rationale for competency-based vocational education is also explained in the document. (KC)

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HANDBOOK FOR DEVELOPING
COMPETENCY BASED CURRICULA
FOR NEW AND EMERGING OCCUPATIONS

A HANDBOOK FOR CALIFORNIA VOCATIONAL EDUCATORS

JUNE, 1980

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TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION TO THE HANDBOOK	1
Purpose of the Handbook	1
How This Handbook is Organized.	2
What is Competency Based Instruction/Curricula?	2
Why Develop Competency Based Curricula?	3
How to Develop Competency Based Curricula for a New Occupation, Figure 1.	4
PART I: HOW TO IDENTIFY NEW AND EMERGING OCCUPATIONS.	5
Introduction--Part I.	6
List of Terms	7
Criteria for Identifying New and Emerging Occupations	8
Problems and Complexities in the Identification Process	9
WAYS OF IDENTIFYING NEW AND EMERGING OCCUPATIONS.	10
Process of Identifying New and Emerging Occupations, Figure 2.	11
Continuously Monitor the Factors that Generate New Occupations .	12
Solicit Advisory Committee Input	15
Vocational Educator's Contact with Business/Industry	17
Use Follow Up Study Data	18
Review Recent Literature on New and Emerging Occupations	19
Analyze and Monitor Data on New and Emerging Occupations Regularly.	20
Conclusion	22

Table of Contents (Continued)

	<u>Page</u>
PART II: HOW TO PERFORM A TASK ANALYSIS ON A NEW OCCUPATION.	.23
Introduction--Part II.	.24
List of Terms.	.25
What is Task Analysis?	.26
Relationship of Occupational Terms with Examples, Figure 3	.27
Task and Duties.	.28
Steps in Performing A Task Analysis, Figure 4	.31
STEPS IN PERFORMING A TASK ANALYSIS	.32
Step 1: Choose the Occupation(s) to be Analyzed	.32
Step 2: Develop or Secure a Preliminary List of Duties and Tasks Performed in the Occupation You Are Analyzing	.32
Task Inventory, Figure 5	.34
Task Listing, Figure 6	.35
Step 3: Review, Refine and Revise the Preliminary List of Tasks and Duties through a Subadvisory Committee.	.36
Duty Listing, Figure 7	.37
Task Listing, Figure 8	.38
Step 4: Verify/Validate the Tasks and Duties of the Occupation.	.40
Task Inventories, Figure 9--15	.43
Step 5: Perform a Task Detailing on Each Task Selected for Inclusion in the Training Program	.50
Task Detailing Worksheet, Figure 16.	.53
Task Detailing Flowchart, Figure 17.	.54
Conclusion	.55

Table of Contents (continued)

	<u>Page</u>
PART III: HOW TO USE THE INFORMATION FROM PARTS I AND II OF THE HANDBOOK TO DEVELOP COMPETENCY BASED CURRICULA.	56
Introduction--Part III.	57
List of Terms	58
Steps in Developing Competency Based Curricula from the Information Derived from Parts I and II, Figure 18	59
STEPS IN DEVELOPING COMPETENCY BASED CURRICULA.	60
Step 1: Develop Student Performance Objectives for Each Task to be Included in the Training Program	60
Step 2: Develop Criterion Tests for Each Student Performance Objective	61
Task Analysis Worksheet, Figure 19	62
Performance Test, Figure 20.	64
Step 3: Implement an Instructional Strategy	65
Course Outline, Figure 21.	66
Lesson Plans, Figures 22, 23	68
Step 4: Revise and Test	70
Conclusion.	73
APPENDIXES	
A. Bibliographic Sources on New and Emerging Occupations	75
B. Bibliographic Sources for Securing Duty and Task Listings	76
Duty Listings	78
Cover Letter	79
Background Sheet	81
Task Inventory Instruction	83
C. Objectives.	85
D. List of Individuals Interviewed	87
BIBLIOGRAPHY	89

INTRODUCTION TO THE HANDBOOK

Purpose of the Handbook:

Developing vocational education programs for "new and emerging occupations" presents a serious and growing problem for vocational educators. Rapid technological advancements and growing societal needs continue to quickly create new occupations or substantial changes in existing occupations. If adequate demand for these occupations exists, vocational programs must be implemented quickly and effectively to meet the needs of industry.

This handbook is designed to help vocational educators identify changes in the labor market and to quickly and effectively incorporate these changes into their curricula. Specifically, the handbook will guide you through the major steps in developing competency based curricula for a new and emerging occupation. These steps are depicted in Figure 1. In short, the handbook will help you to do the following:

1. Identify new and emerging occupations;
2. Perform task analysis on a new and emerging occupation;
3. Develop competency based vocational education curricula.

Although the handbook is specifically designed for new and emerging occupations, the materials presented, particularly in Parts II and III, are applicable also to expanding occupations. Expanding occupations are existing occupations for which increased entry-level demand is now surfacing.

How this Handbook is Organized:

This handbook is divided into three major parts as follows:

Part I: How to Identify New and Emerging Occupations;

Part II: How to Perform Task Analysis on a New Occupation;

Part III: How to Use the Information from Parts I and II to
Develop Competency Based Curricula.

So that you can use this handbook more effectively you will best be served by knowing the various terms before you come to them. Therefore, each section of this handbook contains its own "List of Terms." You may already be familiar with many of the terms listed, however, before making that assumption, why not take a few minutes to go over the definitions before reading each section of the handbook.

What is Competency Based Instruction/Curricula?

Competency based instruction is a systematic way of organizing instruction. In a competency based course, the instruction is designed to insure that students "master" certain job competencies deemed essential for successful job performance. The job "competencies" are the skills, (tasks), knowledges, and attitudes that students must learn to perform a job successfully.

The whole concept of competency based instruction is based on the idea that students must be able to demonstrate that they can successfully perform job competencies to the standards accepted by industry. When students can demonstrate that they can successfully perform a job competency, they are said to be "competent" and can move on to learning the next job competency.

Why Develop Competency Based Curricula?

The development of competency based curricula insures that students who complete a program can successfully perform each task learned to the standards accepted by industry. Additionally, it insures that educators are teaching occupationally relevant material. The implementation of a competency based program, therefore, will help your students be better equipped for the world of work and will help improve your student success rate.

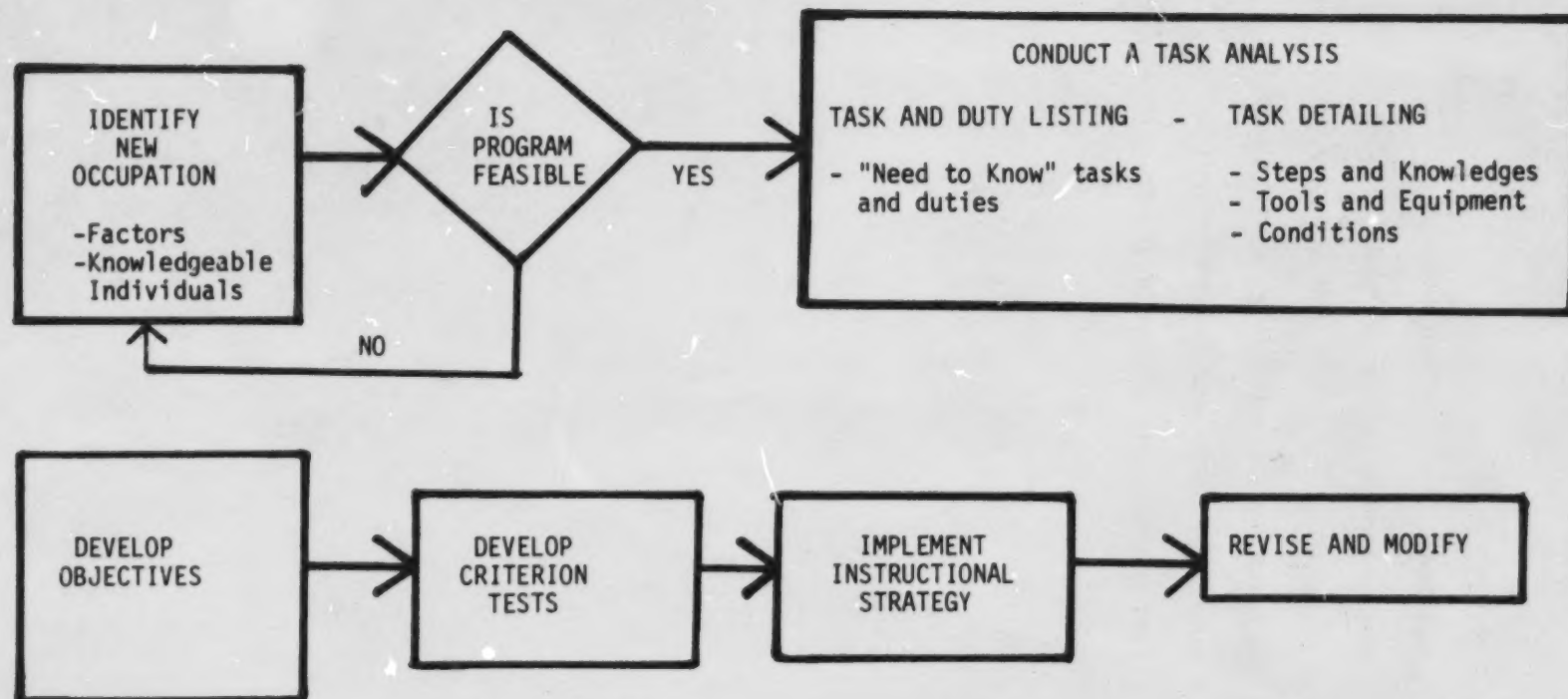


Figure 1

PART I

HOW TO IDENTIFY
NEW AND EMERGING OCCUPATIONS

INTRODUCTION - PART I

The ability to readily identify new and emerging occupations for which demand may suddenly arise is becoming increasingly important to vocational educators. With declining enrollments and budgetary restraints becoming more prevalent, vocational educators will be under more pressure to offer programs which are cost effective and occupationally relevant. Moreover, during the last decade, technological advancements have been so rapid that it is becoming necessary to identify potential new and emerging occupations well before demand actually exists. This would enable vocational educators to start preparing for the occupation so that commitment of resources is timed with increasingly clear and reliable information that job openings will exist.¹

This section of the handbook will provide you with a system to help identify and monitor new and emerging occupations for which new vocational programs might be implemented. When you have read this section of the handbook, you will know the following:

1. The problems and difficulties involved in identifying new and emerging occupations;
2. Ways to monitor and identify new and emerging occupations;
3. Potential areas to watch that might give rise to new and emerging occupations.

LIST OF TERMS

New and Emerging Occupations: A job that is coming into existence or an existing job evolving into one with new skills and requirements.²

Job/Occupation: A collection of duties and tasks constituting the total work assignment of a single group of workers performing essentially the same type of work/or having the same job title.³

In actuality the terms occupation and job are different. "Occupation" is a broader term. There can be several jobs within an occupation. However, for purposes of this handbook, the two terms must be used in the same context as the scope of the study deals with new and emerging occupations (per VEA 1976).

Occupational Cluster: A group of jobs/occupations that are related in subject matter, content or, technical concepts involved.⁴

CRITERIA FOR IDENTIFYING NEW AND EMERGING OCCUPATIONS

For vocational education purposes, the following criteria should be applied to determine if an occupation is a new and emerging one:

(Drewes, 1978) The occupation

- Must have emerged within the past decade

Rationale:

Ten years would allow adequate time for new occupations to emerge but not yet have available training programs established.

- Is skilled or technical in nature (entry-level), requiring at least six months of vocational education preparation but less than a four-year college program.

Rationale:

Assures that occupations identified as new and emerging are within the training confines of vocational education.

- Information is currently available which reflects an anticipated shortage of trained workers within the State over the next five years.

Rationale:

Used to serve as an indicator of need.

PROBLEMS AND COMPLEXITIES IN THE IDENTIFICATION PROCESS

The identification of new and emerging occupations is not an easy task. Inadequate information coupled with the volatile nature of new and emerging occupations make it very difficult to identify them. The following statements reflect some of the difficulties that vocational educators might encounter when attempting to identify new and emerging occupations.

- State and national occupational data bases do not include information on new and emerging occupations.⁵
- Traditional employer surveys are inadequate for identifying new and emerging occupations and in estimating demand for them.⁶
- Unlike in the past, conditions which give rise to new and emerging occupations can create demand for the new occupations in a very short period of time. Therefore, the information-gathering process must start earlier for a new and emerging occupation and data must be monitored continuously.⁷
- Many new and emerging occupations do not have substantial demand for them for quite some time. Therefore, it is difficult to determine at what point in the emerging process vocational education programs should be implemented. Developing curricula too early risks a waste of time and resources, yet an overly conservative approach risks lost opportunities for both students and employers.⁸

WAYS OF IDENTIFYING NEW AND EMERGING OCCUPATIONS

The identification of new and emerging occupations requires a flexible and multifaceted approach. It is not a step-by-step process, rather all ways of identifying new and emerging occupations must be investigated and all information assimilated.

The key, however, to identifying new and emerging occupations is to establish a data-gathering network of communication among individuals/organizations representing all indices of change.⁹

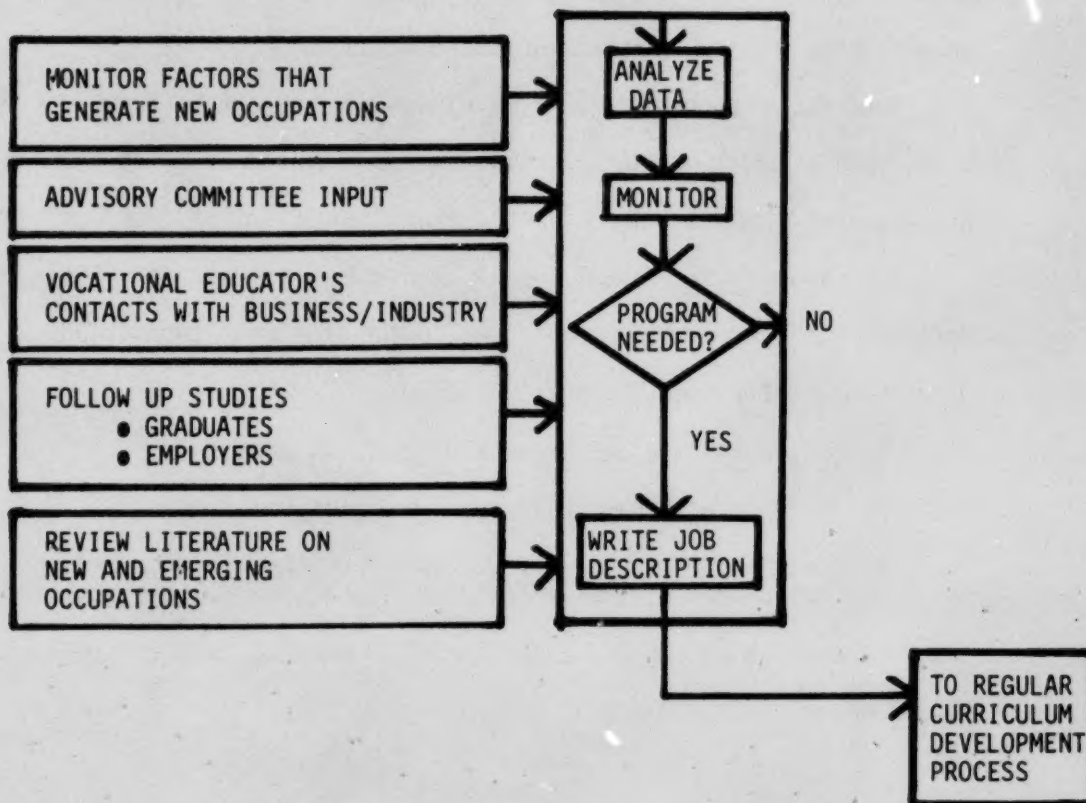
The process for identifying new and emerging occupations is depicted in Figure 2 and broken down in the following pages. This process basically involves the following:

- 1) Identify "new and emerging" occupations early;
- 2) Begin preliminary planning immediately;
- 3) Constantly monitor the occupation so that commitment of resources is timed with increasing demand for the occupation.

This process can also be used to identify expanding occupations for which demand is increasing.

PROCESS OF IDENTIFYING
NEW AND EMERGING OCCUPATIONS

Figure 2



Adapted from "New and Emerging Occupations: A Process for Monitoring and Identifying the Impacts for Vocational Education," Orville Nelson, Center for Vocational, Technical and Adult Education, University of Wisconsin, Stout, Menomonie, Wisconsin, 1979

What are the factors that generate new occupations?

The ability to keep abreast of the factors that generate new occupations is paramount to identifying new and emerging occupations. The following factors singularly and in combination affect the emergence of new occupations:

1. Demographic, societal, and environmental changes;
2. Technological changes and advancements;
3. New legislation and government funding.

How will these factors affect the emergence of new occupations?

1. Demographic, societal, and environmental changes
 - Americans are growing older
 - The demand for health care services should increase.
 - Increased leisure time caused by retirement should create demand in the services industry-- banking and tourism should grow.
 - A decline in the growth rate will create a sharp decline in education, home building, and the military which depend on youth.
 - More women are working
 - The demand for increased services such as child care should continue to grow.
 - Fewer children are being born
 - Labor shortages should occur
 - The use of natural resources is doubling every 14 years in the United States. (The most critical materials will be gone in 100 years or less if we continue the present rate of consumption.)¹⁰
 - New technologies will need to be developed to better utilize and conserve our existing natural resources. Critical areas to watch are energy, water conservation, trees, food.

2. Technological changes and trends

- New technologies often create the following:

- New industries
- New production processes
- Changes in marketing and distribution
- Changes in old industries
- Job restructuring

Keep abreast of new technologies in the following areas:

- Energy and energy related fields

- Look for developments in synthetic fuels. A recent Department of Labor study found that designing and building synthetic fuel plants will require approximately 85,000 people. Areas affected will include the following:
 - Engineering and construction firms who will build the plants.
 - Companies that produce components such as pipe, heat exchanges, and pressure vessels needed for each plant.
 - Mining and earth moving equipment manufacturers.
 - Conventional oil and gas drilling contractors.
- Watch for growth and technological developments in non-fossil energy industries such as solar, biomass, wind, geothermal, and nuclear energy.

- Medical and health fields

- Watch for developments in biomedical equipment technology, electromechanical technology, laser and electro-optical technology, and nuclear medicine technology.
- Watch for growth in the out-of-hospital care fields-- ambulatory or primary care brought about by rising hospital costs.

- Transportation

- Dwindling energy supplies will force the transportation industry to seek other ways of transporting people. Look for developments in the following areas:
 - Mass transit
 - Electric cars

- Electronics industry

- Watch for new developments in the following areas:
 - Semiconductors
 - Computers and computer applications
 - Instruments that test and measure

3. New laws/regulations and/or government funding

New laws and/or government funding can quickly create new jobs. New laws or regulations create a need for individuals to regulate the laws. Additionally, individuals are needed to report compliance of the laws. Government funding creates interest in developing new technologies.

Keep abreast of regulatory policy and/or government funding in the following areas.

- Transportation
- Safety and health
- Environmental protection
- Energy conservation and production
- Rights of individuals in institutions
- Defense

Where can information on these factors be found?

The following sources should be used regularly to provide information on employment trends, government legislation and funding, technological breakthroughs, new jobs, and social, environmental, and demographic trends starting to emerge.

- Newspapers

- Watch the want ad section for clues on new job titles starting to emerge.
- Consult the stock market and business sections to find out about what industries/companies are growing, new technological developments, etc.

- Magazines, newsletters, and trade and professional journals

- Subscribe to and peruse through trade and professional journals, government publications, and union and industrial newsletters to keep abreast of what is happening.

What is an occupational advisory committee:

A committee consisting of local business people, educators, and interested parents and students. Its purpose is to assist and advise the school on matters pertaining to the instructional program.

What information can an advisory committee provide about new and emerging occupations?

Local advisory committees are one of the best sources of information on new and emerging occupations. Advisory committee members should be asked on a regular basis to help provide the following information:

- Identify current and emerging occupations.
- Interpret the impact of new developments in business and industry.
- Identify political, social, and economic trends which might impact on the emergence of a new occupation.
- Assist in securing subscriptions to industrial magazines and membership in industrial organizations.
- Assist in planning and organizing community surveys.

Once a new and emerging occupations has been identified, advisory committees can do the following:

- Review and/or identify the tasks and duties of an occupation.
- Review and/or identify the knowledges, skills, and attitudes needed in the occupation.

How do you organize and operate an advisory committee?

- Assess the school's past and present experience with advisory committees.
- Prepare a charter to include a written rationale for having the advisory committee and procedures to be followed.

- Obtain official permission to organize from the Board of Education.
- Nominate and notify members.

Once the advisory committee is operating:

- Develop rules for operating the committee.
- Elect officers.
- Explain goals of the advisory committee.
- Identify goals and objectives to be achieved.
- Determine long-range employment trends if possible.
- Assist in identifying anticipated technological changes.
- Identify areas of concern and make recommendations.¹⁷

What can vocational educator's do to help identify new occupations?

Vocational educators can provide critical data for the monitoring process. Each vocational educator should be encouraged to do the following:

- Maintain liaison with local business, industry, and union representatives on a regular basis.
- If possible, make industrial visitations to ascertain current employment vacancies, projected replacement needs for one, three, and/or five years, and the number of individuals being prepared for occupations through in-plant training.
- Find out about new technology, products, and experimentations with new equipment and materials that might affect the emergence of new occupations.¹²
- Monitor technological, political, economic, and sociological trends starting to emerge.
- Join and become actively involved in professional associations. Vocational conventions can be an excellent source of information on new and emerging occupations.
- Discuss the implications of industrial trends, new products, equipment, and materials discovered with other staff at departmental meetings.
- Watch industries that are growing in the local area.
- Search through school catalogues to find out about new courses being implemented. These new course offerings might be indicative of new occupations.
- Keep in touch with educational publishers to discover new developments in the field.

What are follow up studies?

Survey instruments used to determine the effectiveness of instruction, to update existing programs, or to plan new programs. Generally, follow up studies are of two types -- graduate and employer follow up studies.

How to use the information from follow up studies

Graduate follow up studies: Graduates' responses on follow up studies can identify current jobs in which graduates are employed. These jobs might be new and emerging occupations or occupations for which training is needed.

Employer follow up studies: Employers' responses on follow up studies about recent graduates can identify new competencies needed by graduates or new occupations for which training is needed.¹³

REVIEW RECENT LITERATURE ON NEW AND EMERGING OCCUPATIONS

A review of literature on new and emerging occupations suggests the following occupations as possible candidates. Discuss local demand for the following listed occupations with your advisory committee and instructional staff. (See Appendix A for a list of bibliographic sources on new and emerging occupations).

Possible new and emerging occupations:

- Biomedical Equipment Technician
- Industrial Hygiene Technologist
- Pediatric Assistant
- Therapeutic Recreation Technician
- Swine Confinement Facility Assistant Manager
- Solar Energy Technician
- Halfway House Resident Manager
- Nuclear Medicine Technologist
- Nursing Home Administrator
- Long Term Care Technician
- Homemaker-Home Health Aide
- Energy Efficiency Technician
- Physical Security Technician
- Nuclear Quality Assurance Inspector

ANALYZE AND MONITOR DATA ON NEW AND EMERGING OCCUPATIONS REGULARLY

As data on technological developments, new legislation, etc. is collected, the following process can be applied:

- Analyze all accumulated data at departmental meetings on a regular basis.
 - Special files could be set up to help monitor the information compiled.
 - Every six months, process the information through a future viewing process such as the Delphi Technique or scenarios of future events to help identify new jobs.¹⁴
- For any occupation considered to be new and emerging, do the following:
 - Write a brief job description. The job description should be used to help monitor the local labor market. The job description should include the following:
 - Job titles(s) commonly used to describe the job.
 - Location and general working conditions.
 - A general statement of the job duties.
 - Typical employees.
- Determine student interest in the occupation.
- Survey the local community.
 - At this point, the local community should be surveyed to determine the short and long-term manpower needs of the new and emerging occupation. Computer surveys are sometimes available through your local school district which provide this information. The following information might be obtained from employers that employ people in the occupation.
 - Number of people currently employed in the occupation, the number currently needed, and the projected number needed in the future.
 - Typical beginning wages and work hours.
 - Constraints or barriers for entry into the occupation, e.g., handicapped or sex barriers.
 - Skill content and minimum requirements needed in the occupation.

- Other occupations in demand and for which training is needed.
- Need for additional training for individuals already employed.
- Recommendations for programs to be expanded, discontinued, or established.

CONCLUSION

Once a new and emerging occupation has been identified, a study must be undertaken to determine the program's feasibility, qualified staff must be recruited, equipment and facilities must be selected, the student population and level of instruction must be determined, and the curricula must be developed.

Parts II and III of this handbook will describe a step-by-step process to help instructors develop competency based curricula for a new and emerging occupation.

PART II
HOW TO PERFORM
A TASK ANALYSIS
ON A NEW OCCUPATION

INTRODUCTION - PART II

The development of good curricula is a key factor to the success of any program. If the curricula is not occupationally relevant, students will not be equipped with the necessary skills to perform successfully on a job. The development of curricula based on task analysis of the occupation will help equip your students with the actual entry-level skills needed for entry into an occupation. Task analysis can help you determine what to teach so that your students can perform successfully on the job. Additionally, task analysis can be used to determine whether tasks and duties of a job can be performed by both sexes. This will help insure sex equity when analyzing a job for vocational education training purposes.

This section of the handbook will provide you with a step-by-step process for performing a task analysis. When you have read this section of the handbook, you will:

1. Understand the meaning of task analysis;
2. Be able to perform a task analysis.

LIST OF TERMS

Competency: A task performed to a certain standard.¹⁵

Duty: Statements that describe a worker's major functions or responsibilities in an occupation. Duty statements help define a job in broad terms so that tasks can be grouped under each duty later.

Duty Listing: A comprehensive list of duties performed in an occupation.

Incumbent Worker: Person working in an occupation.

Occupational Cluster: A group of jobs/occupations that are related in subject matter, content, or technical concepts involved.¹⁶

Task: An actual unit of work performed by workers in an occupation. It defines what the worker does. A task usually generates a product or an observable change in the work environment. It has a definite beginning and ending point.

Task Analysis: The procedure designed to help identify all important elements of a job. The process involves developing a Task Listing and Task Detailing.

Task Detailing: Systematically breaking down each task to determine the skills, steps, and knowledges that an individual needs to be taught to perform a task successfully.

Task Listing: A comprehensive list of tasks performed by workers in an occupation.

Task Inventory: An instrument used to validate/verify the tasks of an occupation consisting of lists of duties and tasks and one or more questions about each task.

Validate/Verify: Confirming that the duty and task statements are actually performed in the occupation. Verifying/validating tasks and duties of an occupation can serve as a basis for deciding which tasks and duties will be included in the training program.

WHAT IS TASK ANALYSIS?

Task analysis is the process, for instructional purposes, of analyzing a job to find out what successful workers do in an occupation and how they perform their job. With the information from a task analysis, instructors can determine what skills, knowledges, and attitudes students will need to be taught to perform a job successfully.

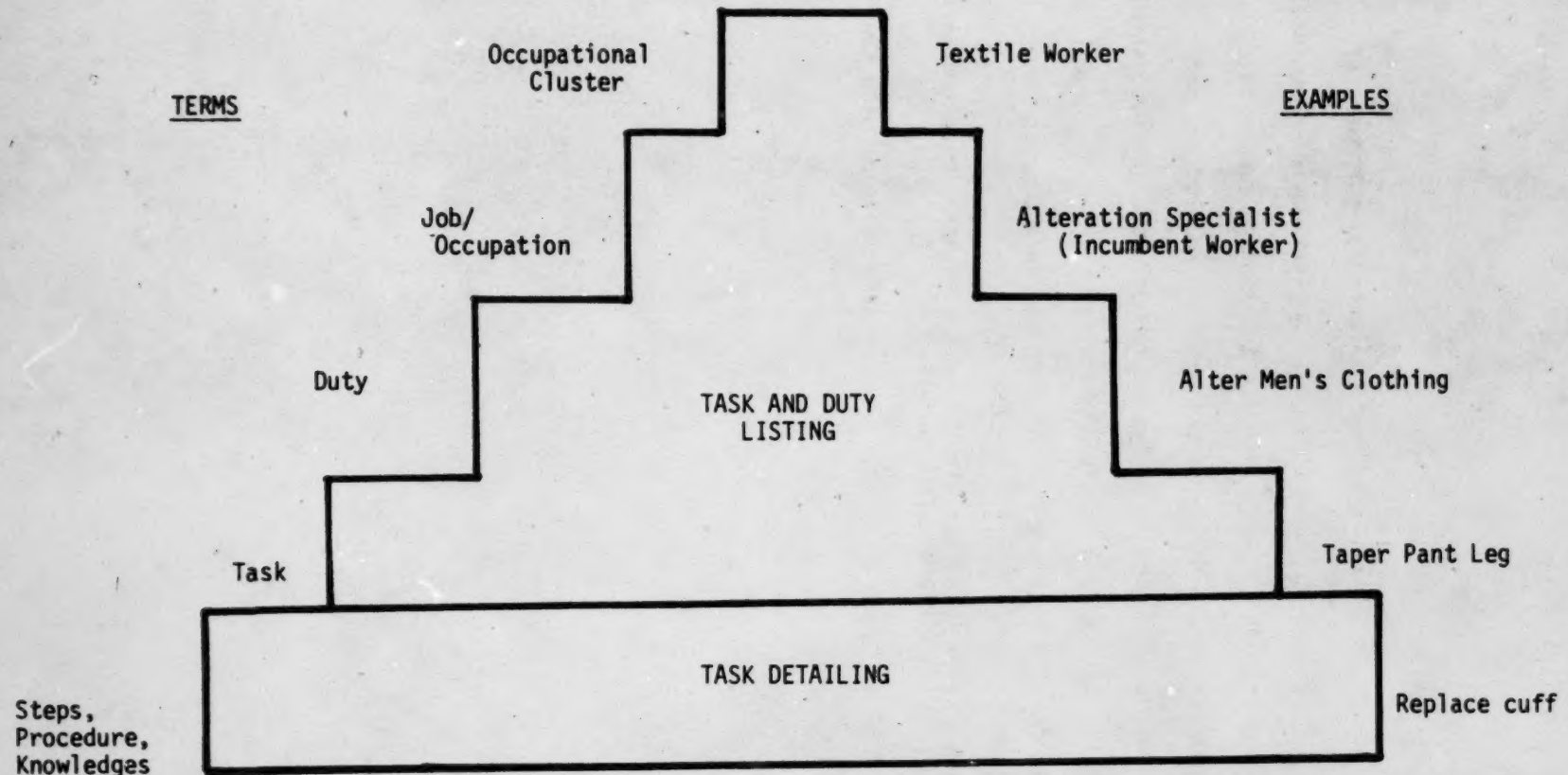
Task analysis is basically a two-fold process:

1. Developing a Task and Duty Listing for an occupation which describes what workers do;
2. Conducting a Task Detailing or Task Flowchart to determine how workers perform each job task.

Figure 3 shows the relationship of occupational terms with the task analysis process.

RELATIONSHIP OF OCCUPATIONAL TERMS WITH EXAMPLES

FIGURE 3



TASKS AND DUTIES

Before you can begin the task analysis process, you must know what a duty is and what a task is. All occupations can be broken down into duties and tasks. This is the basis of the task analysis process.

What is a duty?

DUTIES: Duties are statements that describe a worker's major work functions or responsibilities in an occupation. Generally, there may be anywhere from 6-15 duties for a specific occupation. Duty statements help define the job in broad terms so that tasks can be grouped under each duty later.

Examples of some of the duties typically performed by an automobile mechanic, beautician, and cabinet maker are as follows: (For a comprehensive list of duties for an automobile mechanic, data processor, and a secretary, see Appendix B.)

Examples of Duties:

AUTOMOBILE MECHANIC DUTIES

- Maintains, Repairs, and Replaces Braking Systems
- Maintains and Repairs Cooling Systems
- Performs Engine Overhaul Activities

BEAUTICIAN DUTIES

- Mixing Supplies and Sanitizing Equipment
- Shampooing and Rinsing Hair
- Cutting and Shaping Hair
- Setting and Combing Hair into Style

CABINET MAKER DUTIES

- Applying Wood Veneers and Plastic Laminates
- Cutting and Shaping Components
- Designing and Laying Out Work
- Finishing Surfaces

Look at the above stated duties and notice:

- Each begins with an action verb.
- Each is very general and describes many tasks.
- Each describes a major work function or responsibility typically performed in the occupation.¹⁷

What is a task?

TASKS: Tasks are actual units of work performed in an occupation. They define what the worker does. Each duty is composed of many tasks. A task usually generates a product or an observable change in the work environment. It has a definite beginning and ending point. Depending on the occupation there may be anywhere from 200 to 600 tasks in an occupation.

Listed below are some tasks for the following duties:

Examples of tasks:

AUTOMOBILE MECHANIC

DUTY: Maintains, Repairs, and Replaces Braking Systems

- Repair master cylinder
- Repair and replace brake shoes
- Adjust brake
- Flush brake system
- Repair wheel cylinder

BEAUTICIAN

DUTY: Mixing Supplies and Sanitizing Equipment

- Mix creme rinse
- Mix permanent hair colors
- Perform wet sanitizing
- Sanitize equipment with formaldehyde

CABINET MAKER

DUTY: Applying Wood Veneers and Plastic Laminates

- Apply adhesives
- Cut plastics to size
- Trim edges
- Plane joints

SECRETARY**DUTY: Performing Stenographic Activities**

- Compose correspondence
- Edit letters dictated by employer
- Operate dictaphone
- Operate dictating machine
- Transcribe (type) from dictaphone
- Type minutes of meetings

Look at each of the above stated task statements and notice:

- Each statement starts with a single action verb with the subject "I" understood.
- Each has a brief object of the action verb.
- Each describes a typical unit of work performed on the job.
- Each is a typical unit of work performed as part of its corresponding duty.

STEPS IN PERFORMING
A TASK ANALYSIS

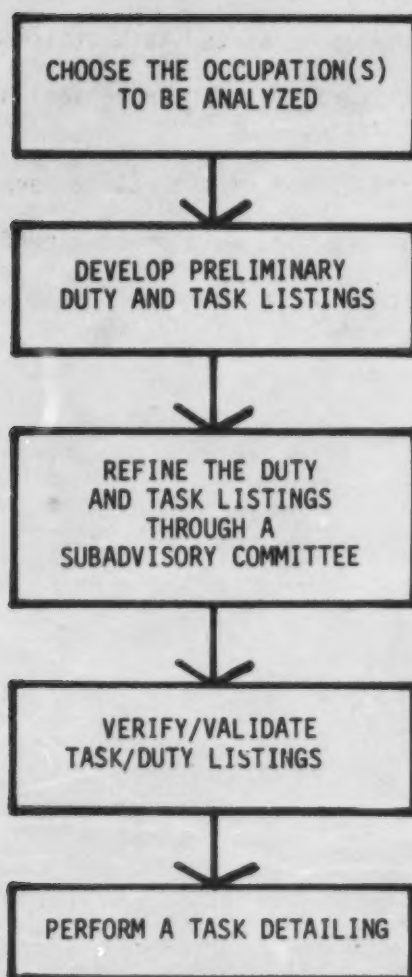


FIGURE 4

STEPS IN PERFORMING A TASK ANALYSIS

Now that you know what duties and tasks are you are ready to perform a task analysis on an occupation. The following steps are required to perform a task analysis. These steps are depicted in Figure 4.

STEP 1: CHOOSE THE OCCUPATION(S) TO BE ANALYZED.

Decide whether the task analysis will be performed on one specific occupation or a "clustering" of occupations.

- At the secondary level, "clustering" of occupations is recommended. (For a detailed explanation of "clustering," consult "Identifying and Improving Vocational Instruction: A Handbook for Individualized Instruction for New Hampshire Vocational Educators," John R. Faust, United States Office of Education).
- At the post-secondary level, analyzing specific occupations rather than groups of occupations (clusters) is recommended.

STEP 2: DEVELOP OR SECURE A PRELIMINARY LIST OF DUTIES AND TASKS PERFORMED IN THE OCCUPATION YOU ARE ANALYZING:

There are several ways you can secure a list of duties and tasks performed in an occupation. Use as many of the following listed ways necessary to help you secure a comprehensive list of duties and tasks in an occupation:

A. Search through occupational literature.

To save you some time, search through the literature to determine if any existing task and duty listings are available.

What to look for?

- Existing task listings and/or task inventories.
See Figures 5 and 6 for an example of a task listing and task inventory.
- Training materials, curriculum guides, course outlines, and job descriptions which might indicate tasks and duties performed in the occupation.

Much of the material in this section was adapted from Performance Content for Job Training, The Center for Vocational Education, The Ohio State University, 1977.

- Lists of
 - tools and equipment used in the occupation
 - standards of job performance or job competencies
 - performance objectives

Appendix B provides bibliographic information on where the above mentioned material can be secured.

- For new occupations, search for materials that pertain to more established occupations out of which the new occupations are being created.
- Acquisition of materials should start early to allow for lag time between identification and receipt of materials.

B. Interview/Observe Incumbent Workers and/or Supervisors in the Occupation.

Some school districts hire a consultant to do this.

Who should be interviewed?

- Interview incumbent workers from several different kinds of businesses. For entry-level positions, choose individuals with 6-18 months experience on the job.

Suggested questions to be asked:

If possible, show the worker a list of duties and tasks assembled through a literature search. The worker can then add, delete, or modify these tasks and duties.

- What duties do you perform as part of your job?
- What tasks do you perform as part of each duty?

C. Secure an Initial Lists of Duties and Tasks Performed in the Occupation from your Advisory Committee Members.

A subadvisory committee consisting of individuals knowledgeable of the duties and tasks performed in the occupation could be assembled.

- D. Talk with other Educators who have performed a Task Analysis on the Occupation.
- E. Use Your Own Knowledge of the Occupation.
- F. Check with trade union officials to determine if they have existing task and duty listings.

TASK INVENTORY

Page 1

SURGICAL TECHNICIAN

Job Title

MARIANNE JACOBSON

Analyst

INSTRUCTIONS:

List each manipulative and knowledge skill relating to the job listed above. To the right of the page are three sections of columns asking specific questions about the Entry Level, Frequency of Performance and Instruction Attained At. An "X" should be placed, by the analyst, opposite each task in the appropriate box of the "ENTRY LEVEL" and "FREQUENCY OF PERFORMANCE" sections. Section three, "INSTRUCTION ATTAINED AT" is to be completed by state representative persons selected by the state department specialist.

Duty No.	Task No.	Task Description	Entry Level		Frequency of Performance			Instruction Attained at		
			Entry	On The Job	Small Amount	Average Amount	Great Amount	High School	Community College	On-the-Job Training
1	0	PREPARES OPERATING ROOM FOR SURGERY								
	1	Inspect operating room for necessary furniture		X		X				
	2	Inspect operating room for cleanliness	X				X			
	3	Scrub for surgery	X				X			
	4	Wear required gown and gloves	X				X			
	5	Select instruments and supplies for each surgery	X				X			
	6	Assemble sterile supplies, medications, solutions and special instruments		X		X				
	7	Verify surgeon's preference for instruments	X			X				
	8	Position instruments for easy access by surgeon	X				X			
	9	Assist circulating nurse to read patient and operating room		X		X				
	10	Count needles, sponges, instruments before, during and after surgery	X			X				
	11	Have count of needles, sponges, instruments verified by nurse		X		X				
	12	Record correct or incorrect count	X			X				
	13	Assist surgeon in gowning and gloving		X		X				
	14	Assist in draping patient for surgery		X		X				
	15	Hand instruments to surgeon as needed		X		X				
	16	Anticipate surgeons need		X			X			
	17	Monitor sterile condition of area constantly	X				X			
	18	Assist anesthesiologist as required		X		X				
	19	Supply medicine, blood, plasma as needed		X		X				
	20	Respond promptly to any message from surgical team	X			X				
	21	Assure patient x-rays are available to surgical team		X		X				
	22	Request additional personnel as needed	X			X				
	23	Keep record of supplies used	X			X				
	24	Record patient blood loss	X			X				
	25	Assist in application of surgical dressings		X		X				
	26	Disconnect tubes and machines when no longer needed		X		X				
	27	Complete necessary paper work at conclusion of operation		X		X				
	28	Help move patient to PAR cart		X		X				
	29	Assist in moving patient to PAR, ICU or patient's room as required	X			X				
	30	Arrange for patient transfer to room after local surgery		X		X				
	31	Assist in clean up of operating room after surgery	X			X				
		44								

Figure 6

TASK LIST FOR ELECTRIC MOTOR REPAIR

Checking Motors

1. Check nameplate for type motor
2. Check nameplate for size and speed of motor
3. Check the nameplate for current registration
4. Check the mechanical condition of motor
5. Check the motor to see if it will run
6. Check stator or field winding
7. Check armature or rotor winding

Direct Current Motor

8. Dismantle D.C. motor
9. Test D.C. field for open circuit
10. Test D.C. field for shorts and grounds
11. Remove one field coil. Check wire size and number of turns
12. Make data card on field winding
13. Wind the field coil
14. Connect the field coil and check polarity
15. Connect the D.C. motor
16. Connect interpoles
17. Test the armature
18. Make data card on armature
19. Insulate the armature
20. Wind armatures for small D.C. motors
21. Wind armatures for medium and large size motors
22. Solder leads to commutator bars
23. Band the armatures
24. Bake and varnish the armature
25. Make wave winding
26. Make lap winding
27. Test the commutator
28. Repair the commutator
29. Adjust and seat brushes
30. Repair and insulate brush rigging
31. Make mechanical repairs
32. Reverse D.C. motors
33. Cut out a shorted armature coil
34. Balance the armature or rotor
35. Check and adjust the air gap of a D.C. motor
36. Check and repair D.C. resistance controls
37. Check and repair D.C. speed controls
38. Check and repair D.C. reversing controls
39. Check and repair magnetic controls
40. Check protective devices
41. Check and repair current controls

Direct Current Generator Repair

42. Check and repair D.C. generator

Follow these steps to prepare Lists of Duties and Tasks performed in the occupation you are analyzing:

1. *Using Figure 7 as a guide, begin by listing the duties performed in the occupation. If you need to, look over the examples of duties previously provided.*
2. *Next, using Figure 8 as a guide, for each duty identified, list the specific tasks performed as part of that duty. (As a task listing is quite extensive, only a partial task listing is shown.)*

Here are a few tips for writing task statements.

Task Statements:

- Should start with a single action verb with the subject "I" understood.
- Should have a brief object of the action verb.
- Must be observable and measurable in terms of time spent and importance.
- Should be clear, concise, and complete so that they are understood by all who read them.
- Should use the jargon of the occupation.

Note: If a duty contains fewer than ten tasks grouped under it, it should be examined for possible combination with a related duty. For example: Organizing and Planning (List all organizing and planning tasks under it.)

STEP 3: REVIEW, REFINE, AND REVISE THE PRELIMINARY LIST OF TASKS AND DUTIES THROUGH A SUBADVISORY COMMITTEE

A subadvisory committee should be created to add missing tasks, delete irrelevant tasks, reword vague or lengthy task statements, and to identify appropriate duty categories under which tasks are to be grouped in the final task listings.

Who should be on the subadvisory committee?

- Select individuals from several different types of businesses who are knowledgeable about the occupation(s) to be analyzed.
- Obtain at least one worker and/or supervisor for each occupation to be analyzed. Do not include personnel managers. From 3 to 8 members should be adequate, however, if the occupation has few workers performing the task, seek additional members

DUTY LISTING

RVTC

VOCATIONAL PROGRAM: AUTOMOTIVE MECHANICSSPECIFIC OCCUPATION: GENERAL AUTOMOTIVE MECHANIC

Listed below are the major duties in the occupation listed above:

1. Maintaining and repairing drive trains
2. Maintaining, repairing, and replacing braking systems
3. Performing maintenance control functions
4. Maintaining and repairing electrical systems
5. Maintaining and repairing fuel systems
6. Maintaining and repairing cooling systems
7. Maintaining and repairing standard and power steering
8. units
9. Performing engine overhaul activities
10. Maintaining and repairing auto air conditioners
11. Maintaining and repairing auto heaters
12. Maintaining and repairing ignitions systems

FIGURE 7

TASK LISTING

VOCATIONAL PROGRAM: Automotive MechanicsSPECIFIC OCCUPATION: General Automotive Mechanic

The following are the tasks for each duty in the above-stated occupation:

DUTIES	TASKS
Maintaining and Repairing Drive Trains	Diagnose clutch operation Diagnose manual transmission operation Diagnose drive shaft operation Diagnose automatic transmission operation Diagnose drive axle operation Inspect clutch assembly Inspect manual transmission assembly Inspect automatic transmission assembly Inspect drive shaft components Inspect drive axle assemblies Rebuild clutch components Rebuild manual transmission Rebuild automatic transmission Rebuild drive axle components Remove and replace clutch components Remove and replace drive axle components
Maintaining, Repairing and Replacing Braking System	Diagnose brake problems Repairs and replaces brake shoes Resurface brake drums Turns brake shoes Adjusts brake Rebuilds wheel cylinder Repairs and replaces wheel cylinders Repairs and replaces master cylinders Rebuilds master cylinders Repairs and replaces brake hoses/lines Repairs and replaces disc brake caliper units Flushes brake system Bleeds brake system Repairs and adjusts Parking brakes Tests proportioning valves Repairs antiskid braking devices Repairs and replaces vacuum power brake units Repairs and replaces air brake units Adds fluid to brake systems
THIS SAMPLE IS NOT COMPLETE	

FIGURE 8

to include: technology developers or equipment designers, factory technicians or service repairmen, systems analysts, company trained personnel, and early groups making use of the new technology or equipment systems, professional association members, and workers in older established jobs out of which tasks for an emerging occupation are being extracted.

How to conduct the subadvisory meeting.

1. Obtain personal identification from each member.
2. Explain the purpose and use of the task and duty listings.
3. Explain how the duties and tasks are to be stated.
4. Provide the members with a job description for the occupation.
5. Show the members a list of duty statements. Examine each duty one by one and ask the following questions. A simple check list could be developed for this purpose.
 - Does this duty reflect a major category of work performed by the worker?
 - Is this duty relevant to an entry-level worker's performance of the job?
 - As stated, does this duty serve as a useful organizer of task statements?

Once all duties have been reviewed, ask the reviewers:

- Are there any duties missing from the list?
 - Ask the reviewers to sequence the duties as they are performed on the job, if possible.
6. Provide each member with a "List of Tasks" for each duty. For each duty read aloud each task statement grouped under it, and ask the following questions:
 - Is the task statement clear? Will everyone understand what this statement means?
 - Is this task covered by another statement in this list?
 - Does this task fit better under another duty?
 - Can this task be performed by an entry-level worker?
 - What tools or equipment are necessary to perform this task?

- When all tasks under each duty have been discussed, probe for additional tasks by asking:
 - Are there any tasks missing from this list?

Note: When analyzing new and emerging occupations, retain every task suggested even if other members declare that it is irrelevant to the occupation.

7. Ask the members to list names of companies that have employees performing the tasks and duties.
8. End the meeting with a note of thanks.
9. Compile a new "Lists of Tasks and Duties" based on the results of the subadvisory committee meeting.

STEP 4: VERIFY/VALIDATE THE TASKS AND DUTIES OF THE OCCUPATION

Since it is impossible to teach every task and duty performed on a job, tasks and duties must be verified/validated to determine which duties and tasks should be included in the training program. Follow these steps in verifying/validating the duties and tasks in the occupation you are analyzing:

1. *Choose one of the following methods to help you verify/validate the tasks and duties that should be included in the training program:*

A. Validate through a subadvisory committee

Call a special subadvisory committee meeting. At the meeting, ask the members questions to determine which tasks and duties should be included in the training program. A good way to do this would be to use a task verification/validation form similar to the one in Figure 9.

B. Through a Task Inventory Survey

Mail a task inventory form to workers and/or supervisors in the field for completion. Samples of various kinds of task inventory forms are shown in Figures 10-16. This method of validation is more complex, however, it yields more precise results. The design of a good task inventory survey instrument is extremely important to the success of the survey.

A typical task inventory survey would include the following:

- Selecting questions to be asked in the task inventory survey.

The selection of questions to be asked of incumbent workers should be based primarily on the information needed. Types of questions commonly asked are as follows:

- How often do you perform each task?
- How much time do you spend performing each task?
- How important is each task for successful performance of the job?
- How soon is task competence expected after job assignment?
- Where should the task be learned?
- Is the task part of an entry-level job?

Generally, each question should be assigned a rating scale of not less than 5 points.

- Designing the task inventory form which includes the duties and tasks of the occupation.

(Samples of various kinds of task inventories are shown in Figures 9 - 15.)

- Selecting the survey population.
- Determining the sample size.
- Administering the task inventory survey which includes the following:
 - Contact the participants.
 - Assemble the task inventory booklets which should include the following: (Samples located in Appendix B).
 - Cover letter
 - Background sheet
 - Instruction Sheet on how to fill out the survey
 - List of tools and equipment compiled during the literature search
 - Task inventory
 - Self return envelope

If possible, provide an incentive for completing and returning the task inventory booklets

- Develop follow up materials

- Follow up letter
- Monitoring device

2. *Choose the tasks and duties that will be included in the training program. When determining which tasks and duties will be included in a training program. Consider the following:*
 - A. Rank duties according to their job importance. Choose those duties that are most relevant for an entry level worker to master.
 - B. Rank tasks within each duty. Criteria that might be used to rank tasks might include the following:
 - Frequency of Performance: Select tasks that are frequently performed in an occupation.
 - Importance of Task: Select tasks that are critical to job success even if they are not performed frequently.
 - Number of beginning workers performing the task: Select tasks that are performed by a significant number of entry level workers in the occupation.¹⁸
 - Learning Difficulty: Select tasks that require considerable practice and instruction to learn. If a task can be learned with little difficulty on the job, do not include it or use limited instruction.
3. *Eliminate any tasks from the training program in which:*
 - There is a lack of facilities or equipment for proper training of the task.
 - There is nothing about the task that requires training.
 - Job training is a superior method to formal school learning of the task.
 - Entry level workers are not required to perform the task.
 - Advance license or certification is required before performance is allowed.
4. *Prepare a final "Task Listing" and "Duty Listing" (like the ones in Figures 7-8) to include the tasks and duties chosen for the training program.*

TASK VERIFICATION FORM

RVTC

VOCATIONAL PROGRAM: HorticultureSPECIFIC OCCUPATION: Ornamental HorticulturistDUTY F: Performing Outside Work Activities

For each task listed below, determine whether an entry level worker Needs to Know how to perform the task or whether the task is performed by workers with two or more years experience and is therefore Nice to Know.

Nice to Know	Need to Know	<u>Tasks</u>
☐	☐	<u>Mulch seed beds</u>
☐	☐	<u>Lay sod</u>
☐	☐	<u>Repair plastic pipe leaks</u>
☐	☐	<u>Operate front end loader</u>
☐	☐	<u>Maintain golf course greens</u>
☐	☐	<u>Identify lawn diseases</u>
☐	☐	<u>Plant burlap-wrapped stock</u>
☐	☐	<u>_____</u>
☐	☐	<u>_____</u>

FIGURE 9

TASK INVENTORY

Page _____

SURGICAL TECHNICIAN

Job Title

MARIANNE JACOBSON

Analyst

INSTRUCTIONS:

List each manipulative and knowledge skill relating to the job listed above. To the right of the page are three sections of columns asking specific questions about the Entry Level, Frequency of Performance and Instruction Attained At. An "X" should be placed, by the analyst, opposite each task in the appropriate box of the "ENTRY LEVEL" and "FREQUENCY OF PERFORMANCE" sections. Section three, "INSTRUCTION ATTAINED AT" is to be completed by state representative persons selected by the state department specialist.

Duty No.	Task No.	Task Description	Entry Level		Frequency of Performance			Instruction Attained at			
			Entry	On The Job	Small Amount	Average Amount	Great Amount	High School	Community College	On-the-Job Training	Related Training
3	9	Clean surgery room and instruments according to accepted standard procedure		X		X					
	10	Orient students and new employees to work area		X		X					
	11	Provide input to supervisor regarding changes in policy or procedure	X			X					
	12	Report unusual incidents to supervisor	X			X					
	13	Make out incident report as required	X			X					
	14	Make changes on doctor's preference cards as requested	X			X					
	15	Instruct new employees on policy and procedure		X		X					
	16	Instruct Operating room attendants in cleaning of room		X		X					
	17	Provides assistance where needed		X		X					
	18	Demonstrate equipment to persons unfamiliar with same		X		X					
4	0	WORKS IN A SAFE MANNER									
	1	Read safety manuals	X			X					
	2	Exercise caution in using autoclaves	X			X					
	3	Guard against puncture wounds from needles, blades and sharp instruments	X			X					
	4	Wear protective clothing around x-ray equipment	X			X					
	5	Follow safety instructions when working around anesthesia and other gases	X			X					
	6	Take required breaks to relieve tension of operating room	X			X					
	7	Make incident report on all injuries	X			X					
	8	Make suggestions for improved safety as judged needed		X		X					
5	0	MAINTAINS PROFESSIONAL STANDING									
	1	Attend on-the-job inservice classes		X		X					
	2	Attend related professional conventions		X		X					
	3	Study for certification exam		X		X					
	4	Take exam to obtain certification		X		X					
	5	Submit to A.S.T. no less than 24 hrs of C.E. credits per year		X		X					

FIGURE 10

INVENTORY INSTRUMENT

Name: _____
 Position: _____
 Business Address: _____
 Phone: _____
 Date: _____

Department of Vocational Education
 Agriculture Education Section
 Colorado State University
 Fort Collins, CO 80523

NATIONAL AGRICULTURAL OCCUPATION COMPETENCY PROJECT¹²

Instructional Area: Production Agriculture

Employment Area: Beef Production

Occupation Cluster: Feed Truck Driver

Job Description: Drives a special feed hauling truck in transporting prepared feed to cattle pen feeding bunks as assigned. Unloads truck with the power driven mechanism and distributes feed in feed bunks. Performs maintenance on the truck such as lubrication, changing oil, and does minor repair such as replacing light bulbs, fuses, and changing tires. Keeps truck clean. Inspects the truck for proper operation and safety.

Directions: Check degree of importance for each competency to enter this occupation in 1975 as a beginning employee based on your experience. Additional spaces are provided for competencies you may wish to add and evaluate.

Competencies (Tasks)	Essential	Important	Of Some Importance	Not Important	Does Not Apply
1. Driving and unloading truck.					
a. Distributes feed in feed bunks.					
b. Drives gas or diesel truck.					
c. Operates unloading mechanism.					
d. Positions truck for loading feed.					
e.					
f.					
2. Inspecting and maintaining truck.					
a. Checks air cleaner; services when needed.					
b. Checks brakes; services when needed.					
c. Checks coolant; services when needed.					
d. Checks lights and other electrical devices; replaces bulbs and fuses when needed.					

¹² Gobbo, "Competencies Needed for Employment in Beef Production Enterprises," pp. 121-122.

FORM FOR CHECKING PERFORMANCE

OCCUPATION: Artificial Inseminator^a

Duty: Handling Cattle

No.	Task	Check If Performed
1	Detect heat	
2	Determine time to inseminate	
3	Identify symptoms of reproductive diseases	
4	Maintain breeding records	
5	Move cattle	
6	Operate breeding chute	

8. Adapted from Gobbo, "Competencies Needed for Employment in Beef Production Enterprises," p. 150.

FIGURE 12

The Center for Vocational Education, Ohio State University, "Conduct an Occupational Analysis," p. 31

LIST OF ACTIVITIES

For Business Data Programmers

(Activities are grouped under 12 general duty areas)

Key to abbreviations:

- 0 = Definitely not a part of my job.
 1 = Under unusual circumstances may be a minor part of my job.
 2
 3
 4 = A substantial part of my job.
 5
 6
 7 = A most significant part of my job.

DUTY A: SYSTEM ORGANIZING AND PLANNING ACTIVITIES

Circle one category for each item.

1. Analyze company operations to determine where most significant improvements can be made.	0	1	2	3	4	5	6	7
2. Analyze data processed for possible modification and combination of reports.	0	1	2	3	4	5	6	7
3. Analyze data processed to make sure that desired information is obtained.	0	1	2	3	4	5	6	7
4. Analyze documentation for completeness and accuracy for data processing operations and control.	0	1	2	3	4	5	6	7
5. Analyze functional area reports for format errors.	0	1	2	3	4	5	6	7
6. Balance and correct reports.	0	1	2	3	4	5	6	7
7. Brief supervisor and staff.	0	1	2	3	4	5	6	7
8. Conduct on-the-job training for data services personnel.	0	1	2	3	4	5	6	7
9. Coordinate work of data services unit with activities furnishing report data.	0	1	2	3	4	5	6	7
10. Develop standards and factors for use in management control systems.	0	1	2	3	4	5	6	7
11. Establish data services production controls and standards.	0	1	2	3	4	5	6	7
12. Evaluate work performance of data services personnel.	0	1	2	3	4	5	6	7
13. Fill out questionnaire inventory forms.	0	1	2	3	4	5	6	7
14. Inspect methods used to process data.	0	1	2	3	4	5	6	7
15. Orient newly assigned data services personnel.	0	1	2	3	4	5	6	7

FIGURE 13

INSTRUCTIONS FOR COMPLETING TASK INVENTORY

Carefully read each of the Task Statements and place a check mark (✓) in the column labeled *Check* for each task which you perform on your present job.

After checking all tasks which you perform, then rate only the task you have checked by placing a number 1, 2, 3, 4, 5, 6, or 7 in the column labeled *Time Spent* which most closely estimates the amount of time you spend in performing the task.

Time Spent means the total time you spend on each task you are rating, compared with the time you spend on each of the other tasks you do.

At the bottom on any page, write in and rate any tasks you do which are not listed.

EXAMPLE:

DATA PROCESSING TASK INVENTORY		Page ____ of ____ Pages
LISTED BELOW ARE A DUTY AND THE TASKS WHICH IT INCLUDES. CHECK ALL TASKS WHICH YOU PERFORM. ADD ANY TASKS YOU DO WHICH ARE NOT LISTED, THEN RATE THE TASKS YOU HAVE CHECKED.	CHECK	TIME SPENT
	K. PROGRAMMING COMPUTERS	✓ If Done
1. Adapt programs written in symbolic language to different computer configurations.	✓	4
2. Analyze applications to select appropriate utility programs and subroutines.	✓	2
3. Analyze computer inputs prior to test run and follow-up.	✓	1
4. Analyze programming documentation.		
5. Audit computer inputs after test run and follow-up.	✓	6
6. Code computer applications using a reports program generator.		
7. <i>Code programs utilizing Mac-Man One language.</i>	✓	7

FIGURE 14

LIST OF ACTIVITIES

for

General Secretaries

(Activities are grouped under 12 general duty areas)

		CIRCLE ☐ one category:
		P = PRIOR to training T = Formal TRAINING program S = On SITE, after employment E = Related work EXPERIENCE O = OTHER (write location) N = NOTHING TO LEARN
	Check ☒ if part of job	
DUTY A: ORGANIZING AND PLANNING ACTIVITIES		
1. Arrange itineraries for speakers, salesmen, and others.	☐	P T S E O N
2. Arrange for training aids, facilities, and equipment.	☐	P T S E O N
3. Compile one report from numerous small ones.	☐	P T S E O N
4. Decide on least expensive and most desirable way to communicate (telegram, long distance call, etc.).	☐	P T S E O N
5. Develop procedures for the maintenance of news files and reference libraries.	☐	P T S E O N
6. Draft and submit job description.	☐	P T S E O N
7. Draft policy recommendations for submission to higher authority.	☐	P T S E O N
8. Draft recommended changes to handbooks, manuals, publications, and forms.	☐	P T S E O N
9. Establish operating procedures for suspense files.	☐	P T S E O N
10. Establish procedures for the distribution of forms, reports, and publications.	☐	P T S E O N

59

FIGURE 15

STEP 5: PERFORM A TASK DETAILING ON EACH TASK SELECTED FOR INCLUSION IN THE TRAINING PROGRAM

Once tasks have been selected for inclusion in a training program, a task detailing should be performed. Task detailing breaks down each task to determine the key steps (doing) and knowledges (knowing) that an individual needs to be taught to perform a task successfully. It serves as a basis for developing student performance objectives—particularly "knowing" (cognitive) and "doing" (pyschomotor) objectives. The task detailing process identifies the following:

- Cues for starting the task.
- Conditions necessary for performance of the task.
- Major steps of the task (doing).
- Decisions made while performing the task.
- Safety, technical, and related knowledge necessary to perform the task successfully (knowing).
- Equipment, tools, and materials used when doing the task.
- The degree of desired proficiency or standard.

While the task detailing process may seem unnecessarily cumbersome, it should be stressed that these steps are essential in making intelligent choices about teaching techniques and learning materials. With the data available from a task detailing, you can better avoid teaching more theory than is necessary and keep the course occupationally relevant. In this way, you teach only what is necessary to help the students learn a job.¹⁹

There are several ways in which task detailing information can be gathered. Choose the method that best suits your needs.

Ways to Secure Task Detailing Information

- A. Interview incumbent workers and/or subject matter specialists qualified in the task.
- B. Observe the task being performed.
- C. Use your own knowledge of the occupation.

Follow these steps to perform a task detailing for the tasks that will be included in the training program:

1. *Using a Task Detailing Worksheet like the one in Figure 16 or developing a Task Detailing Flowchart like the one in Figure 17, analyze each task by doing the following:*
 - a. Assign each task a number for identification purposes.
 - b. List the name of the training program being analyzed.
 - c. List the task being analyzed.
 - d. List the environmental conditions under which the task is typically performed. Example: garage location.
 - e. List the situation(s) or cues in which the performance of the task is most likely to occur. That is, what would prompt the worker to perform the task? Example: For the task "cash a check," the cue would be "customer requests that a check be cashed."
 - f. List the tools, equipment, materials, supplies, references, and procedural aides used when performing the task.
 - g. In the Key Step column, list the major steps and decisions sequentially, from start to finish, that the worker goes through when performing the task. Number these steps. Each step should begin with an action verb. Under each major step, list the substeps, if any, which make up that procedure.
 - h. List when the task terminates. That is, how does the worker know that the task is completed.
 - i. In the standards section, list the minimal acceptable degree of accuracy or proficiency that an entry-level worker would need to perform the task successfully.

Note: If time is not critical do not include it as a standard. This step is extremely critical as the standards that you decide on will form the basis of student performance objectives. CHOOSE STANDARDS THAT ARE REALISTIC AND ONES THAT THE STUDENTS CAN ATTAIN.

- j. List other ways on a separate worksheet, if any, to perform the task.
- k. In the Essential Knowledges column, list the essential technical, related and safety knowledges necessary to accurately perform each step of the task. That is, list what a person needs to know to perform each step of the task. Examples: basic facts, terminology, physical laws, safety precautions.

Note: Not all steps will have special knowledges.

(Number these with the same numbers you numbered the corresponding steps.) If any substeps were listed, also, list the essential technical, related, and safety knowledge required.

TASK DETAILING WORKSHEET

53

PROGRAM AUTOMOTIVE		TASK NO. 315.000	
TASK STATEMENT Change a flat tire			
Conditions under which task is performed: Any			
Cue: Car has flat tire			
Tools, Equipment, Material, References, Aids used: Spare tire, jack, lug wrench, air pump			
KEY STEPS List sequentially the Key Steps and decisions that lead to the completion of the task.		ESSENTIAL KNOWLEDGES For each key step, list (if any) what an individual has to know (technical safety and related knowledges) to complete each step successfully.	
1. Check spare 2. Remove hub cap. 3. Loosen nuts with lug wrench. 4. Raise car with jack 5. Remove nuts and remove flat tire. 6. Install spare tire 7. Tighten nuts 8. Lower car with jack 9. Replace hub 10. Put tools away		1. Spare must be good. 3. Do not remove nuts before raising car. Know what a lug wrench is. 4. Know how to operate jack 6. Know how to lift wheel on hub. 8. Lower jack slowly	
STANDARDS: (acceptable level of performance for entry level worker)			
Quality: Without injury		Time Limit: 15 minutes	
Amount:		Content: According to manufacturer's specifications.	

FIGURE 16

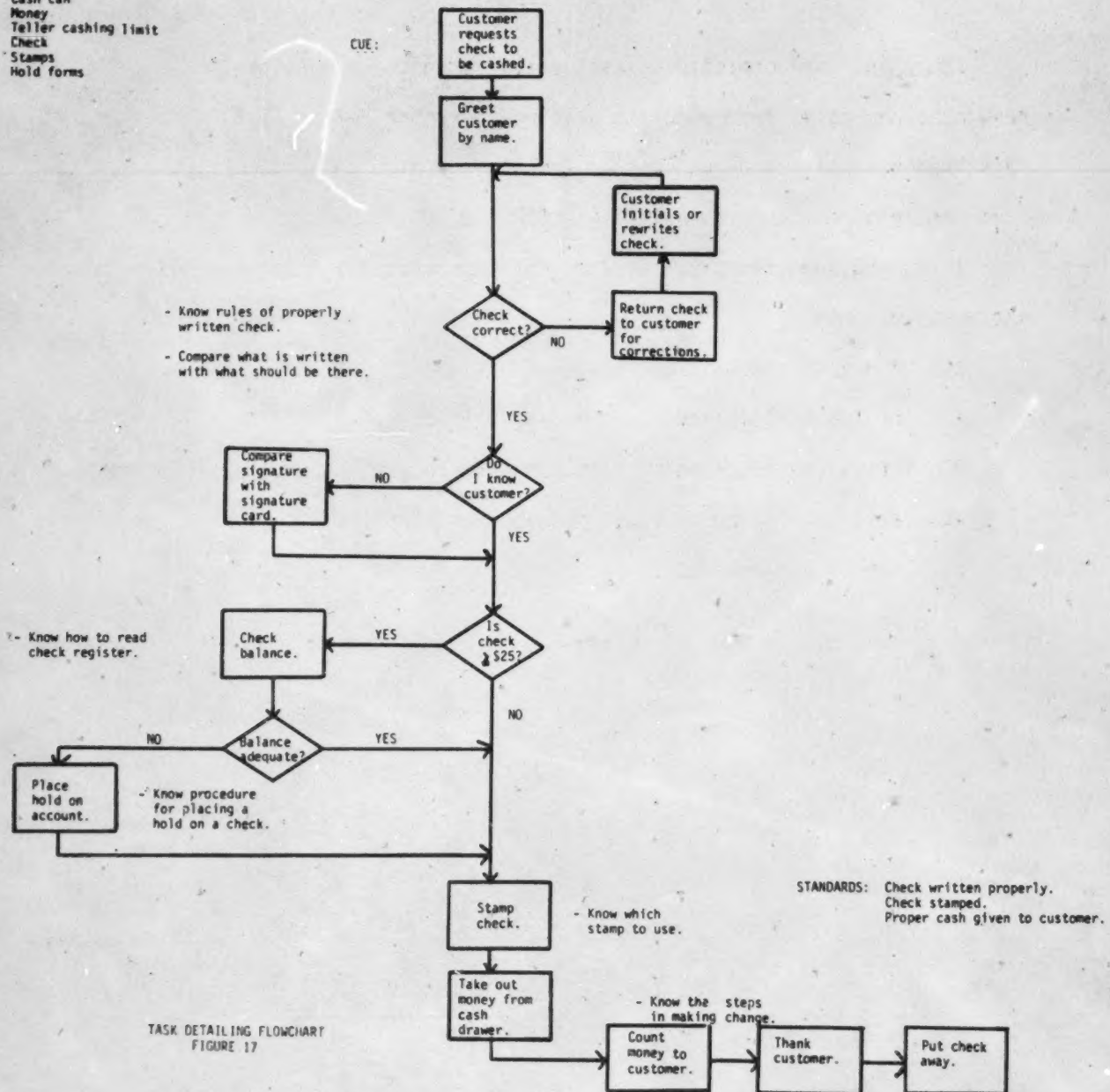
Adapted from Ridge-Vo-Tech Center, Haines City, Florida

TASK NO: 100.000
 PROGRAM: BANK TELLER PROGRAM
 TASK STATEMENT: Cash a personal check for customer.
 CONDITIONS: Teller window.

54

Tools and Equipment:
 Cash can
 Money
 Teller cashing limit
 Check
 Stamps
 Hold forms

CUE:



TASK DETAILING FLOWCHART
 FIGURE 17

CONCLUSION

Once you have completed a task analysis on the occupation you have a sound basis from which to develop your curricula. Part III of this handbook will show you how to develop competency based curricula from the information from Parts I and II.

In conclusion, the task analysis process involves five major steps as follows:

1. Choose the occupation(s) to be analyzed.
2. Develop preliminary duty and task listings.
3. Refine the duty and task listings through a subadvisory committee.
4. Verify/validate the tasks and duties of the occupation.
5. Perform a task detailing.

PART III

HOW TO USE THE INFORMATION
FROM PARTS I AND II OF THE
HANDBOOK TO DEVELOP
COMPETENCY BASED CURRICULA

Once an occupation has been identified and the skills and knowl-edges needed in the occupation have been analyzed through a task analysis, all groundwork has been performed for developing competency based curricula.

This section of the handbook will show you how to develop competency based curricula using the information derived from Parts I and II. When you have read this section of the handbook, you will be able to:

1. Prepare student performance objectives from the information provided in the task analysis;
2. Develop criterion tests based on the student performance objectives;
3. Implement an instructional strategy.
4. Revise and modify the curricula.

LIST OF TERMS:

Competency Based Instruction/Curricula: A total system for planning, developing, and implementing a curriculum designed to insure that students acquire measureable skills, knowledges, and attitudes essential for successful job performance.²⁰

Competent: Demonstration of mastery of occupational requirements that includes skills, knowledges, and attitudes necessary for job entry.²¹

Criterion test: An evaluation instrument which is used to assess whether students have meet the predetermined student performance objectives.

Instructional Lesson: A basic building element of a course. It contains all the details concerning content to be taught, the techniques of instruction to be followed, and references and materials to be used.²² Each task in an occupation would generally represent an instructional lesson.

Instructional Unit: The major sections of a course. Each duty in an occupation would generally represent an instructional unit.

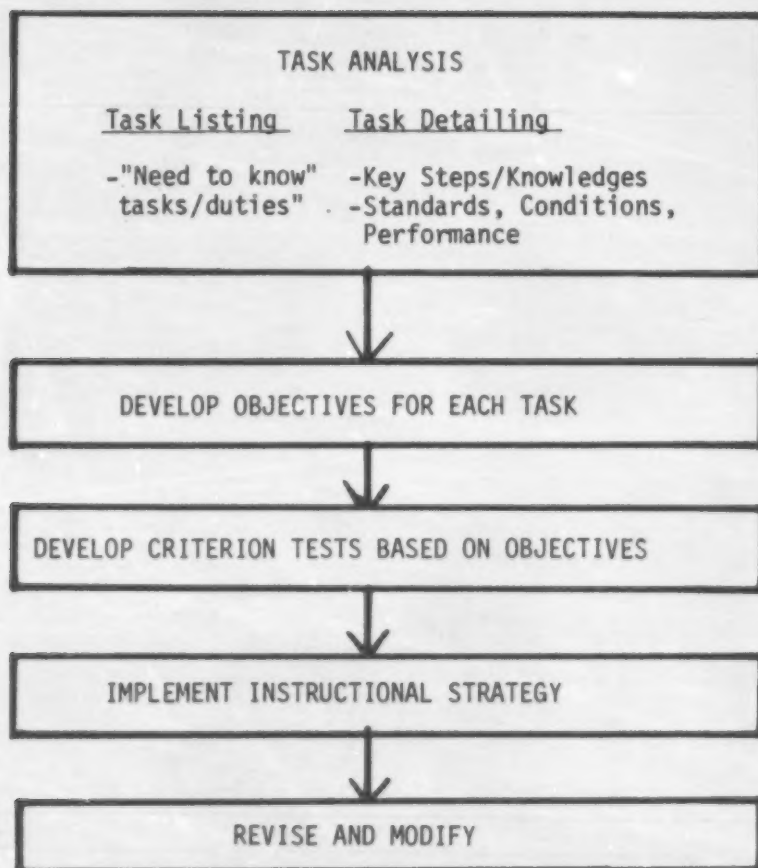
Mastery: The level of performance or achievement that consistently meets occupational standards set by vocational instructors responsible for a vocational program.²³

Student Performance Objectives: Statements that describe exactly what students must be able to do, the conditions under which the performance will occur, and the standards by which the students will be evaluated.

Performance test: A test used to determine if the student can perform the correct processes as well as if the student can produce the correct product. Performance tests require direct observation of the student.

Product evaluations: Tests used to determine whether a student can produce a correct product. They do not require direct observation of the student.

STEPS IN DEVELOPING COMPETENCY BASED
CURRICULA FROM THE INFORMATION DERIVED
FROM PARTS I AND II



STEPS IN DEVELOPING COMPETENCY BASED CURRICULA FROM THE INFORMATION DERIVED FROM PARTS I AND II

Since the aim of competency based instruction is to provide students with the knowledges (knowing), skills (doing), and attitudes needed for successful performance in an occupation, a system must be developed to help the instructor transfer this information to the students. The following steps can help you develop competency based curricula from the information derived from Parts I and II of this handbook. These steps are depicted in Figure 18.

STEP 1: DEVELOP STUDENT PERFORMANCE OBJECTIVES FOR EACH TASK TO BE INCLUDED IN THE TRAINING PROGRAM.

The key to moving from tasks of a job to the components of a course is to translate the tasks into student performance objectives.²⁴ These student performance objectives will tell the students exactly what they will have to do to be considered "competent" in a task. Additionally, student performance objectives can help you select methods, materials, and criterion tests to help the students "master" each student performance objective.

Follow these steps to develop student performance objectives from the information derived from the Task Detailing Worksheets/Flowcharts that you developed in Part II. (Note: If you are unfamiliar with writing student performance objectives, review the material entitled "Objectives" in Appendix C.)

1. *Using Figure 19 as a guide, write a student performance objective for each task in your training program to include conditions, performance, and standards. Use the information from the following sections of your Task Detailing Worksheets/Flowcharts as your major source of information:*
 - a) Conditions and Tools and equipment sections (CONDITIONS)
 - b) Task statement section (PERFORMANCE)
 - c) Standards section (STANDARDS)

2. *It is suggested that you also write student performance objectives for important steps and/or knowledges of a task that must be mastered before the students can perform the task successfully. If necessary, also write a student performance objective for any attitudes that you want the students to develop. By writing student performance objectives for these steps, knowledges, and attitudes, you insure that they will be taught.*

Note: You do not write student performance objectives for all steps and knowledges of a task. Write student performance objectives only for those steps and knowledges that the students must master before they can perform the entire task successfully. Why:

- Some steps and knowledges need not be taught as everyone knows how to do them.
- Some steps are performed only when the entire task is practiced.

Student performance objectives based on steps and knowledges may be written in abbreviated form--that is, the conditions and standards may be eliminated from the objective. See Figure 19 for examples.

STEP 2: DEVELOP CRITERION TESTS FOR EACH STUDENT PERFORMANCE OBJECTIVE.

Once student performance objectives have been written, you will need to develop evaluation instruments for each student performance objective. A criterion test is generally a written or performance type test which is used to determine whether students have achieved the student performance objective. When students can pass the criterion tests for a task, they are said to be "competent" in the task.

Follow these steps to develop criterion tests for each student performance objective:

1. *After analyzing each student performance objective, determine the type of criterion test (written, performance, or attitude checklist) that will be needed to assess whether the student performance objective has been met.*

Examples:

Given ten drawings of hand tools used in an automotive mechanics program, identify them and their use. You must obtain 100% of the written test.

Type of test: written--multiple choice

TASK ANALYSIS WORKSHEET

62

PROGRAM AUTOMOTIVE		TASK NO. 315.000	
TASK STATEMENT		Change a flat tire ← PERFORMANCE	
Conditions under which task is performed:		Any ← CONDITIONS	
Cue:		Car has flat tire	
Tools, Equipment, Material, References, Aids used:		Spare tire, jack, lug wrench	
KEY STEPS List sequentially the Key Steps and decisions that lead to the completion of the task. 1. Set emergency brake/block wheels 2. Remove hub cap 3. Loosen nuts with lug wrench 4. Raise car with jack 5. Remove nuts and remove flat tire 6. Install spare tire 7. Tighten nuts 8. Lower car with jack 9. Replace hub 10. Put tools away Student Performance Objective: Given a car with a flat tire, jack, spare tire, and lug wrench, change flat tire according to manufacturer's instructions and specifications in fifteen minutes without injury. Student performance objectives based on steps and/or knowledges. - Operate a jack		ESSENTIAL KNOWLEDGES For each key step, list (if any) what an individual has to know (technical safety and related knowledges) to complete each step. 1. Block front and rear of wheels. 3. Do not remove nuts before raising car. 4. Know how to operate jack 6. Know how to lift wheel on hub. 7. Tighten securely. 8. Lower jack slowly	
STANDARDS			
STANDARDS: (acceptable level of performance for entry level worker)			
Quality:	Without injury	Time Limit:	15 minutes
Amount:		Content:	According to manufacturer's specifications.

72

FIGURE 19

Examples:

Given situations in which the student will have to interact with other members of the class, the student will act courteously toward other members of the class. All performances on the instructor checklist must have an acceptable rating.

Type of test: attitude checklist

Given a customer with a counterfeit bill, process the counterfeit bill. All steps on the instructors checklist must be given an acceptable rating.

Type of test: performance test--performance checklist

Types of tests:

- To measure student performance objectives which pertain mostly to "doing" something, prepare performance tests or product evaluations. (See Figure 20 for an example of a performance test).
- To measure student performance objectives which pertain mostly to "knowing" something, prepare written tests.
 - Types of written tests include recognition (true/false, multiple choice, matching) and recall tests (completion, listing, and essay items).
- To measure student performance objectives which pertain mostly to attitudes to be acquired prepare attitude checklists.

2. *Prepare a criterion test that meets the following criteria:*

- a) *The test gives clear, complete directions to the students;*
- b) *The test requires performance of the same behavior and under the same conditions as specified in the student performance objective.*

Example: Given a car with a flat tire, spare tire, and lug wrench, change the flat tire per the manufacturer's instructions and specifications within fifteen minutes and without injury.

Test: Prepare a performance test like the one in Figure 20 which actually requires the students to change a flat tire. A multiple choice test would not be appropriate. Notice that each activity in Figure 20 corresponds to the steps and knowledges listed in the Task Detailing Worksheet in Figure 19.

OBJECTIVE: Given a car with a flat tire, jack, spare tire, and lug wrench, change the flat tire according to manufacturer's instructions and specifications in fifteen minutes without injury.

PERFORMANCE TEST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Unaffected wheels were blocked front and rear.		
2. Emergency brakes were applied.		
3. Jack was correctly positioned.		
4. Lugs were loosened before wheel was completely raised.		
5. Tire was lifted on hub correctly.		
6. Lugs and replacement wheel were sufficiently secured.		
7. Removed wheel and tools were returned to appropriate place in trunk of car.		
8. Tire was changed within 15 minutes.		

Teague, Wayne and Faulker, T. L., Developing Performance Objectives and Criterion Referenced Measures for Performance-Based Instruction, p. 46.

STEP 3: IMPLEMENT AN INSTRUCTIONAL STRATEGY

At this point, you are ready to consolidate and use the material that you have developed thus far. You will now learn how to use an instructional strategy to help the students master the student performance objectives. Such an instructional strategy includes the following:

- a) Prepare a course outline;
- b) Develop lessons plans;
- c) Develop a teaching/learning strategy.

Follow these steps to implement an instructional strategy:

1. Prepare a Course Outline

Using the Task Listings that you previously prepared in part II, number the tasks and duties in the order (sequence) in which they will be presented in the instruction. Use figure 21 as a guide.

Note: Notice that duties become instructional units and the tasks become instructional lessons.

TIPS FOR SEQUENCING:

- Sequence tasks based on the order in which they occur in the job.
- Sequence tasks and duties from simplest to most difficult or complex.
- When sequencing tasks and duties, ask yourself the following questions: What other duties/tasks would the students need to master before they can perform this duty/task? (Use the Task Detailing Worksheets/Flowcharts and student performance objectives that you prepared to help you answer this question.)

2. Develop Lesson Plans for Each Task

A well developed instructional lesson should serve as the means by which your students will achieve each task. At minimum, a well written lesson plan should include the following:

- a) Student performance objectives;
- b) Purpose for learning the task;
- c) List of tools, equipment, etc. needed by the students;
- d) Step-by-step instructions for the acquisition of the steps, skills, and knowledges specified in the performance objectives;

TASK LISTING
(Course Outline)

VOCATIONAL PROGRAM Grocery Checker

SPECIFIC OCCUPATION Checker/Cashier

The following are the tasks for each duty in the above-stated occupation:

DUTIES (Instructional Units)	TASKS (Lessons)	SEQUENCE
4.0 Preparing Produce for Market	Explain advertising concepts	4
	Demonstrate produce knowledge	1
	Prepare produce for sale	3
	Display produce	2
1.0 Orientation, Safety, and Sanitation	Recognize management functions	3
	Identify career opportunities in food distribution	1
	Identify safety and sanitation practices in grocery department	2
2.0 Performing Checkout Duties	Operate cash register	2
	Perform optional transactions	4
	Cash customer's check	1
	Perform tax transactions	3
7.0 Making Customer Contact	Demonstrate customer relations	1
	Describe today's food store customer	
THIS SAMPLE IS NOT COMPLETE		

Figure 21

Adapted from Identifying and Improving Vocational Instruction: A Handbook for Individualizing Instruction for New Hampshire Vocational Educators, p. 63.

- e) A means of providing progress checks and/or self evaluation checks with immediate feedback to the student.
- f) Criterion tests capable of evaluating the following:
 - Whether the task has been accomplished.
 - Whether the necessary steps and knowledges have been acquired.

Figure 22 shows you a model lesson plan that incorporates the four steps in the learning process: preparation, presentation, application, and evaluation. Figure 23 provides a completed lesson plan based on the model in Figure 22.

Follow these steps to prepare an effective lesson plan:

Using the information in Figures 22 and 23 as your guide, prepare a lesson plan for each task in the training program. Use the following sources of information to help you develop the lesson plans:

- a) Student performance objectives
- b) Task Detailing Worksheet/Flowchart
- c) Student population

A WORD ABOUT SELECTING MATERIALS:

- o Select only materials that will help your students satisfy the student performance objectives.
- o Choose material based on your student population. Questions to consider might be
 - Is the reading level at a suitable level for the student?
 - Are examples understandable?
 - Does the material provide adequate practice for the student? If not, develop your own practice exercises.
 - Does the material have gaps? If it does, disregard the material or augment it with other material.

3. Develop a teaching/learning strategy

A teaching/learning strategy should be developed to assist the students in learning the student performance objectives. Develop a teaching/learning strategy which includes the following:

- 1. Objectives are made available to the students, in writing, before they start working on a lesson/task. In this way, students will know exactly what they will have to do to be considered "competent."

OBJECTIVE: Student performance objectives for the task.

Approximate length of lesson

ACTIVITIES	PROCEDURE/ RESOURCES
<u>PREPARATION:</u> Purpose: Statement telling students why they should learn the task.	Lecture/Reading Material
<u>PREPARATION:</u> -Review prerequisite knowledges and/or steps . -Review steps/procedure of task -Demonstrate step-by-step the skills, knowledges, and/or steps	Lecture/Instruction sheet listing tools, theory, steps/Written materials Lecture/Instruction sheet giving steps/Textbook Demonstration Media showing procedures
<u>APPLICATION:</u> Guided Practice: Students practice the skills, knowledge, and/or steps under supervision or by providing cueing. Provisions for immediate feedback.	Practicing the tasks, solving problems Self checks with answers provided.
<u>EVALUATION:</u> Test students to see if they have mastered the task. If necessary, test the students to determine if they have mastered the knowledges of the task.	Performance Checklist Written Test Self checks

Figure 22

OBJECTIVES: Given a car with a flat tire, jack, spare tire, and lug wrench, change the flat tire according to the manufacturer's specifications and instructions in fifteen minutes without injury.

- Operate a jack

60 minute lesson

ACTIVITIES	RESOURCES/ PROCEDURES
1. Present lecture on importance of being able to change a flat tire quickly.	Overhead Transparencies
2. -Quickly review procedure sheet on how to operate a jack. -Demonstrate how to operate the jack using the procedure sheet -Have students practice jacking a car in groups of three. -Give students a checklist to help students determine if they can jack a car.	Procedure Sheet Demonstration Checklist
3. -Review procedure on how to change a flat tire using manufacturer's instructions. -Discuss essential knowledges that students need to know about each step. -Demonstrate how to fix a flat tire using manufacturer's instructions.	Text: Manufacturer's Specifications Task Detailing Worksheet/ Flowchart
4. -Assign students to practice changing a flat tire.	Assignment sheet Materials
5. Give students tests	Performance test

Figure 23

2. Students take criterion tests whenever they believe they are ready for them.
 - To eliminate stragglers, provide students with suggested time limits for completion of a lesson.
3. Students advance to a new lesson/task only when they can demonstrate "mastery" ²⁵ of the lesson/task by passing the criterion test.
 - Students who can pass the criterion test for a lesson should be allowed to advance to the next lesson.
 - Students who cannot pass the criterion test should be allowed to restudy the material or be given assistance. They should have the opportunity to take the test again.
4. Students receive immediate feedback on their test performance. Figure 24 shows a teaching/learning system which incorporates these above-stated characteristics.
5. Students are encouraged to help one another.
6. When possible, each student has freedom to sequence his own instruction.
7. The instructor's role is that of a motivator of students, facilitator of learning, and tutor and counselor.
8. The instructor monitors each student's progress through some sort of recordkeeping system which might include the following:
 - Validating the student's mastery of each student performance objective;
 - Recording student performance objectives currently being accomplished and objectives not yet attempted;
 - Recording the number of attempts of an objective and the time required to gain mastery of an objective. 26

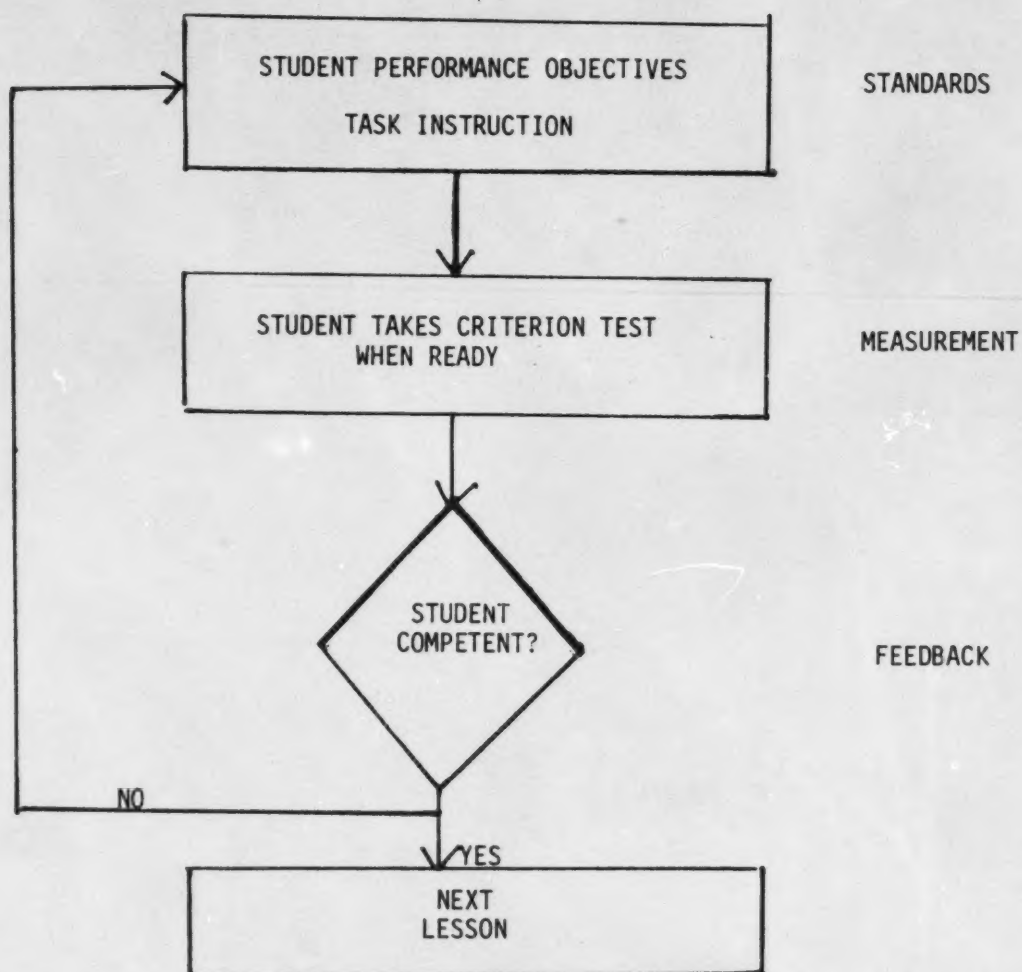
STEP 4: REVISE AND MODIFY

Once the program has been implemented, the final step in developing competency based curricula is to revise and modify the curricula to determine two things:

- 1) Does the course succeed in teaching what it set out to teach?

TEACHING/LEARNING SYSTEM

Figure 24



- 2) Does the course teach what is actually required for successful entry-level employment in the occupation?²⁷

Follow these steps to revise and modify your curricula.

Start by analyzing each student performance objective.

1. Ask yourself the following question about each objective:

What percentage of the students achieved this student performance objective?

- *If all or most of the students achieved the objective, you succeeded in teaching what you set out to teach.*
- *If many of the students did not achieve the student performance objective (10-15%), analyze the student performance objective, methods, media, and learning materials to determine:*
 - a) *If the problem is ineffective training, or an*
 - b) *Improperly selected or unrealistic student performance objective. Make the necessary changes.*

2. Compare the existing student performance objectives with the actual job to determine if they are still relevant. Ask yourself the following questions:

- *Has the job changed?*
- *Have any skills been eliminated or added?*
- *Are new tools or equipment being used?*
- *Are new techniques being used?*

CONCLUSION

Competency based instruction, as has been discussed in this handbook, is a systematic approach to effective instruction. If you chose to use competency based instruction in your course, it will allow you to "guarantee that your instruction works," and will guarantee that your instruction is related to the needs of industry. "In other words, it will allow you to increase your instructional power."²⁸ Additionally, such a systematic approach to developing curricula will enable you to keep abreast of potential vocational programs and help you to determine curriculum requirements in a systematic, cost-effective way.

In conclusion, the development of competency based curricula for a new and emerging occupation involves the following:

1. Identify a "new and emerging" occupation.
2. Perform a task analysis on the occupation to determine the following:
 - a. The "need-to-know" duties and task in the occupation that should be taught;
 - b. The skills, knowledges, and attitudes that students will need to learn to successfully perform each task.
3. Develop student performance objectives which will tell the students exactly what they will have to do to be certified "competent" in the task.
4. Develop criterion tests for each student performance objective which will assess whether the students are competent in the task.
5. Implement an instructional strategy which includes the following:
 - a. Prepare a course outline.
 - b. Develop lesson plans based on the task.
 - c. Implement a teaching/learning strategy.
6. Revise and modify the curricula to improve the course effectiveness.

APPENDIXES

APPENDIX A

Bibliographic Sources on
New and Emerging Occupations

Identifying and Planning for New and Emerging Occupations, A Suggested Guide, Paulette Meleen, et al, Contract Research Corporation, Belmont, Massachusetts, sponsored by U.S. Office of Education, Curriculum Development Branch.

Current and Future Employment Opportunities in New and Emerging Occupations within Illinois. D. W. Drewes, et al, Conserva, Incorporated, Raleigh, North Carolina, 1978, sponsored by State Board of Education, Illinois Office of Education, Department of Adult, Vocational and Technical Education, Research and Development Section.

Curriculum Development Needs for Vocational Education; New and Changing Occupational Areas, Pascal D. Forgione, Jr., A. Lee Kopp, The National Center for Research in Vocational Education, Ohio State University, Columbus, Ohio, 1979.

Development of Career Opportunities for Technicians in the Nuclear Medicine Field, (author unnamed), Technical Education Research Center, Inc., Cambridge, Massachusetts, 1975, sponsored by U.S. Office of Education.

New and Emerging Entry-Level Office and Distributive Occupations and Their Effect on Business Education Curricula, G. W. Maxwell and Judith Knight O'Hare, San Jose State University, San Jose, California, 1979.

"Emerging Occupations" The Wisconsin Vocational Educator, 1978.

Bibliographic Sources for Securing Duty and Task Listings

1. General Sources of Occupational Information:

(Check your school library for the following sources). Search for training materials, curriculum guides, course outlines, research documents, task inventories, and task listings.

Abstracts of Instructional and Research Materials in Vocational and Technical Education (AIM/ARM) ERIC Clearinghouse, The Center for Vocational and Technical Education, Ohio State University, 1900 Kenny Road, Columbus, Ohio 43210

Current Index to Journals in Education (CIJE)

C. C. M. Information Services, Inc., 866 Third Avenue, New York, N. Y.

Datrix II. Computerized information retrieval system available from Xerox University Microfilm, Ann Arbor, Michigan.

Dissertation Abstracts International

Xerox University Microfilms, (published monthly), Ann Arbor, Michigan 1968 to present.

Education Resources Information Center (ERIC) Computerized information retrieval system available through your state and university libraries.

Research in Education (RIE). Began November 1966. Monthly.

Subscription. Send check or money order (no stamps) to the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402

The National Network for Curriculum Coordination in Vocational and Technical Education. For specific information, contact the state liaison representative (SLR), Brent Aiken, Program Manager, Vocational Programs and Evaluation, 721 Capital Mall, Sacramento, CA 95814.

2. Sources of Task Inventories and Task and Duty Listings:

-The U.S. military has used task inventories for several years. They are available from the Personnel Research Laboratory, Lackland Air Force Base, Texas 78236, U.S. Marine Corps, Office of Manpower Utilization (A Field Activity, G-1 Division), Marine Corps Development and Education Command, Quantico, Virginia 22134.

-An additional source of both military and civilian inventories is the Human Research Organization, 300 North Washington Street, Alexandria, Virginia 22314.

Bibliographic Sources for Securing Duty and Task Listings (cont.)

-The Vocational-Technical Education Consortium of States (V-TECS) conducts task analyses to develop catalogs of 1) performance objectives 2) criterion instruments and 3) performance guides for use in vocational technical education. Membership in the consortium enables members to share task analyses. Nonmembers, however, are permitted to purchase VTECS catalogues.

Contact: Vocational-Technical Education Consortium of States
795 Peachtree Street, N.E.
Atlanta, Georgia 30308
(404) 897-6158

3. Sources of Standards:

-American National Standards (ANSI). Catalog of American National Standards. N. Y.: ANSI, August, 1977.

Lists sponsor organizations, acronyms, and designations of many American National Standards. Includes costs and how to obtain materials. Sources have been used by several states in the determination of standards for performance objectives. Could be helpful in determining task statements.

Available free from:

AMERICAN NATIONAL STANDARDS INSTITUTE
1430 Broadway
New York, N. Y. 10018

(212) 354-3300

Taken from Vocational-Technical Education Consortium of States, Technical Reference Handbook

Duty Listings

I. Automotive Mechanics

- A. Organizing and Planning
- B. Supervising
- C. Evaluating and Inspecting
- D. Training
- E. Performing Maintenance Control Functions
- F. Performing - Engine Overhaul Activities
- G. Maintaining and Repairing Power Trains
- H. Maintaining and Repairing Automatic Transmissions
- I. Maintaining and Repairing Electrical Systems
- J. Maintaining and Repairing Fuel Systems
- K. Maintaining and Repairing Cooling Systems
- L. Maintaining and Repairing Standard and Power Steering Units
- M. Maintaining and Repairing Braking Systems
- N. Maintaining and Repairing Front Ends
- O. Maintaining and Repairing Automobile Air Conditioners
- P. Maintaining and Repairing Automobile Heaters
- Q. Lubricating and Maintaining

II. Business Data Processor

- A. Supervising Data Services Functions
- B. Supervising Management Analysis
- C. Supervising Automatic Data Processing Equipment Operations
- D. Supervising Programming
- E. Supervising Data Systems Analysis and Design
- F. Performing Data Processing Functions
- G. Performing Management Analysis Functions
- H. Operating Automatic Data Processing Equipment
- I. Performing Systems Programming
- J. Programming Scientific Programming
- K. Programming Computers
- L. Performing Feasibility Studies (Pilot Projects)
- M. Designing Data Systems

III. Secretary

- A. Organizing and Planning
- B. Supervising and Implementing
- C. Coordinating and Performing Personal Activities for Employer
- D. Inspecting and Evaluating
- E. Training
- F. Performing Stenographic Activities
- G. Performing Bookkeeping and Accounting Activities
- H. Preparing Forms and Publications
- I. Performing Receptionist Activities
- J. Performing Clerical Activities
- K. Maintaining Files and Library
- L. Performing Mailroom Activities

COVER LETTER

INDEPENDENT GARAGE OWNERS OF OHIO, Inc.

8 East Long Street - Room 422 Telephone: (614) 221-4094
COLUMBUS, OHIO 43215



Dear Mr.

We need your help! The Independent Garage Owners Association of Ohio and The Center for Vocational and Technical Education at The Ohio State University are cooperating to assemble a complete list of tasks that are performed by automotive mechanics. Because you have been identified as an outstanding mechanic, we need your advice in assembling this information which will aid you and your profession in the following ways:

1. Specific jobs and paths for advancement can be better defined within the automotive mechanics field
2. To provide information for a mechanic certification program
3. Better training programs can be developed in which both the new mechanic and the master mechanic can take part.

What we are asking for is a little of your time and the results of your experience on the job; to review the enclosed task list for automotive mechanics. Only you can tell us whether these lists are complete and valid.

Please fill out the brief informational page and follow the directions for checking and rating the tasks on the list. We have enclosed an Ohio State pen and a stamped envelope for returning the completed inventory. The pen is yours to keep as a token of our appreciation for your help.

Only you can make this research go and only you can help to raise your profession to the level to which it rightly belongs.

Sincerely,

Sincerely,

Independent Garage
Owners Association

The Ohio State University
Research Specialist

SB/ds

Enclosures

*P.S. We have also enclosed a 1971-1972
Ohio State football schedule.*

BACKGROUND SHEET

BACKGROUND INFORMATION

(Use this sheet if you are a SUPERVISOR of secretaries)

INSTRUCTIONS: Please check the box opposite the *one* item in each section that most appropriately describes your experience. ☒

WHAT IS YOUR PRESENT JOB POSITION? (check the *one* that is most descriptive, regardless of actual job title used in your agency)

- | | |
|--|---|
| ☐ Executive Secretary | ☐ Administrative Assistant or Administrative Officer |
| ☐ Chief Clerk | ☐ Professional Worker (for example, insurance agent, lawyer, research psychologist, building contractor)—(please write in your job title): _____ |
| ☐ Office Manager, or Department Manager | _____ |
| ☐ Head of Secretarial Services | ☐ Other (please write in): _____ |
| | _____ |

IN WHAT KIND OF ORGANIZATION OR INDUSTRY ARE YOU EMPLOYED? (check the *one* most appropriate)

- | | |
|--|--|
| ☐ Agricultural Production | ☐ Insurance |
| ☐ Banking or Finance | ☐ Legal or Law Enforcement Services |
| ☐ Communications | ☐ Manufacturing of Products |
| ☐ Construction | ☐ Merchandising or Sales |
| ☐ Distribution or Transportation of Goods or People | ☐ Natural Resources (other than Agriculture) |
| ☐ Education or Training | ☐ Personal Services |
| ☐ Equipment or Vehicle Servicing | ☐ Utility Services (such as power, water, fuel) |
| ☐ Food Processing | ☐ Other (please write in): _____ |
| ☐ Health or Safety Services | _____ |

INSTRUCTIONS: Please write in the boxes the number of years of work experience for each of the following questions.

ABOUT HOW MANY TOTAL YEARS OF EXPERIENCE DO YOU HAVE IN DIRECTLY SUPERVISING THE WORK OF GENERAL SECRETARIES? (enter number)

ABOUT HOW MANY RECENT GRADUATES OF JOB TRAINING PROGRAMS DID YOUR IMMEDIATE ORGANIZATION HIRE LAST YEAR FOR THIS OCCUPATION? (enter number)

TASK INVENTORY INSTRUCTIONS

QUESTION #1 — "Task Occurrence"

DIRECTIONS FOR REPORTING WHICH ACTIVITIES YOU PERFORM ON YOUR PRESENT JOB

(Please read this page carefully and completely)

1. *During the last year or so in your present job position as a Business Data Programmer, which of the activities in the List of Activities have you performed? Place a check mark or "X" in the column to the right of each activity statement to indicate which tasks you have actually been doing. Task activities not performed by you should be left blank.*
2. *Be sure to read every activity listed. Do not depend on the duty labels that are used to group the activities. These duty categories are not definite. They may contain some of your job activities, even when you do not generally perform the duty itself.*
3. *Do include as part of your job:*
 - a. *Recent work experiences as a Business Data Programmer in other offices of your present firm, but **not** for other employers.*
 - b. *Performance of an activity not normally done by you, but that you did do at least once as part of your job, even if it was in a very special or unusual circumstance.*
4. *Do not mark activities:*
 - a. *Done only when you were employed in some other job position (such as Junior Programmer, Engineering and Scientific Programmer, or Systems Analyst).*
 - b. *If you occasionally "assist" someone else to do the activity, but you are not too greatly involved in the performance. However, if you handled a significant portion of the activity (and only you can be the judge of that), the occasion may be counted.*
 - c. *If they are actually performed by an assistant assigned to you, and not by you.*
5. *In answering this question of which activities you actually perform, pay particular attention to the "action verb." The "action verb" is usually the first word of each statement. Do **not** indicate performance of activities done by a subordinate and only supervised by you, **unless** the "action verb" implies such supervision as a part of the activity.*
6. *The pages of the Task Inventory booklet should not be removed when answering this question; they will need to be in proper sequence later to process your answers along with those of other people answering this question.*

NOW TURN TO PAGE 1 OF THE ACTIVITIES LIST,
AND BEGIN MARKING YOUR ACTIVITIES IN THE BOXES PROVIDED.

Thank you for your participation in this study.

APPENDIX C

OBJECTIVES

Student performance objectives are statements which communicate behavior which students must demonstrate when they have successfully completed a unit of learning. For purposes of this handbook student performance objectives can be defined as statements which communicate to the students exactly what they must be able to do to perform a task successfully, the conditions under which they will perform the job tasks, and the standards by which they will be evaluated. The student performance objectives should have sufficient detail so that they succeed in communicating the instructor's intent and do not leave any room for misunderstanding. One of the most popular methods of writing objectives is the Mager method comprised of three components:

CONDITIONS: The actual conditions, limitations, and environment under which the student will perform the task.

Each condition should match the job as closely as possible and might include the following:

- Tools, equipment, materials, references, and procedural aids the student must use or will be provided with when performing the task.
- Environmental conditions under which students will perform the task. (Example: garage location)
- Things, if any, that will be denied the student when performing

PERFORMANCE: The visible actions of the student while carrying out the learning activity. It tells the students the task that they will be expected to perform.

THE STANDARDS: The minimal acceptable degree of accuracy or proficiency that students must achieve when performing the task.

Each standard should be one that any entry-level worker should be required to achieve and might include the following:

- Degree of accuracy required when performing the task
- Quality of the finished product
- Time limit

Examples of Student Performance Objectives:

- CONDITIONS:** Given a handwritten letter of any length, containing four spelling mistakes.
- PERFORMANCE:** Type a business letter.
- STANDARDS:** The letter must be typed using one of the following formats (block or semiblock) and must have no spelling mistakes and no visible errors.
- CONDITIONS:** Given a pair of slacks with folded up cuffs and necessary equipment and supplies
- PERFORMANCE:** Remove the cuff
- STANDARDS:** There must be no sign of alteration outside.

LIST OF INDIVIDUALS INTERVIEWED

Robert Andreyka
College of Education, Adult and
Vocational Education
University of South Florida
Tampa, Florida 12/1/79

William F. Bain
Assistant Director
Fresno Unified School District
Fresno, CA 12/10/79

William Blank
Assistant Professor
University of South Florida
Tampa, Florida 12/3/79

William Brickner
Professor
Organization and Management
San Jose State University
San Jose, CA 11/28/79

Orv Buesing
Director - Student Services
San Jose Regional Programs
San Jose, CA 10/23/79

Art Butano
Chairperson, Industrial Arts
San Jose State University
San Jose, CA 10/9/79

Lois Callahan
President
College of San Mateo
San Mateo, CA 11/19/79

Benton Calwell
Dean of Occupational Education
Mt. San Jacinto College
San Jacinto, CA 10/18/79

Mike Caplis
Research Manager, E.D.D.
Employment Data and Research
Los Angeles, CA 11/29/79

Philip DeMarco
Dean of Occupational Education
West Valley Community College
Saratoga, CA 10/29/79

Don Drewes
President
Conserva, Inc.
Raleigh, Illinois 12/3/79

Larry Erickson
School of Education
UCLA
Los Angeles, CA 12/1/79

Pat Ferguson
Director
North Santa Clara County
Regional Occupational Programs
Sunnyvale, CA 11/1/79

Glenn Guldberg
Dean of Occupational Education
Citrus College
Azusa, CA 10/18/79

Victor L. Harville
Technical Consultant
Vocational-Technical
Education Consortium of States
Atlanta, Georgia 12/4/79

Bill Hampton
Director
Ridge Vocational Technical Center
Haines City, Florida 10/18/79

Colleen Karr
Department Chairperson
Ohlone College
Fremont, CA 11/5/79

Ed Muraski
Dean of Occupational Education
El Camino College
Van Nuys, CA 10/18/79

Vaunden Nelson, Department Chairperson
Claudia Duffy
Home Economics Department
San Jose State University
San Jose, CA 10/4/79

Wiley Leighton McNabb
American Institute for Research
Palo Alto, CA 11/27/79

Dixie Mitchell
Department Chairperson
Westmont High School
Campbell, CA 10/17/79

Frances Nunes
Occupational Program Developer
San Jose Community College District
San Jose, CA 10/22/79

Herbert Oestreich
Professor
Human Resource Administration
School of Business
San Jose State University
San Jose, CA 10/18/79

J. Edmond Phillips
Field Center Manager
Occupational Analysis Field Center
Department of Labor
Los Angeles, CA 11/29/79

Jay Rusmore
Psychology Department
San Jose State University
San Jose, CA 10/12/79

Judith Singer
Research Analyst
Employment Data and Research
Employment Development Department
San Francisco, CA 10/30/79

Glenn Van Noy
Dean of Occupational Education
Laney College
Oakland, CA 10/18/79

Glenn Vaughan
Office of the Santa Clara
County Superintendent of
Schools
Vocational Education
100 Skyport Drive
San Jose, CA 10/26/79

Robert Walker
Vocational Education
Assistant Director
Foothill Community
College District
Los Altos, CA 10/24/79

George Whaley
Associate Professor
Organization and Management
San Jose State University
San Jose, CA 11/12/79

Dick White
Dean of Occupational Education
Cerritos College
Norwalk, CA 10/18/79

Margaret Wilkes
Business Advisor and On-Campus
Recruitment Coordinator
Career Planning and Placement
San Jose State University
San Jose, CA 10/25/79

John Vanzant
Occupational Information Specialist
National Occupational Coordinating
Committee
Washington, D.C. 12/2/79

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Workshops Attended

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FOOTNOTES

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¹⁸William L. Ashley, Tom L. Hindes, and Faith L. Justice, Manufacturing and Related Task Inventories/Strategies for Curriculum, (Ohio: Ohio State University), p. 57.

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²⁰John R. Faust, Identifying and Improving Vocational Instruction for New Hampshire Vocational Educators, (New Hampshire: Keene State College, 1979), p. 9.

²¹Ibid., p. 9.

²²Ashley, Hindes, and Justice, op. cit., p. 60.

²³Faust, op. cit., p. 11.

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